See P. 5

GUIDEBOOK

for the

Sixteenth Annual Field Conference

of the

TRI-STATE GEOLOGICAL SOCIETY

by

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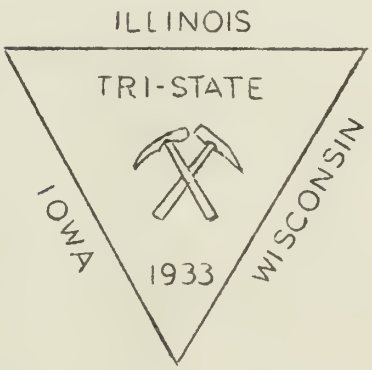
Illinois Geological Survey



CENTRAL NORTHERN ILLINOIS

October 11 and 12, 1952

Illinois Geological Survey

Urbana, Illinois

GUIDEBOOK SERIES 2

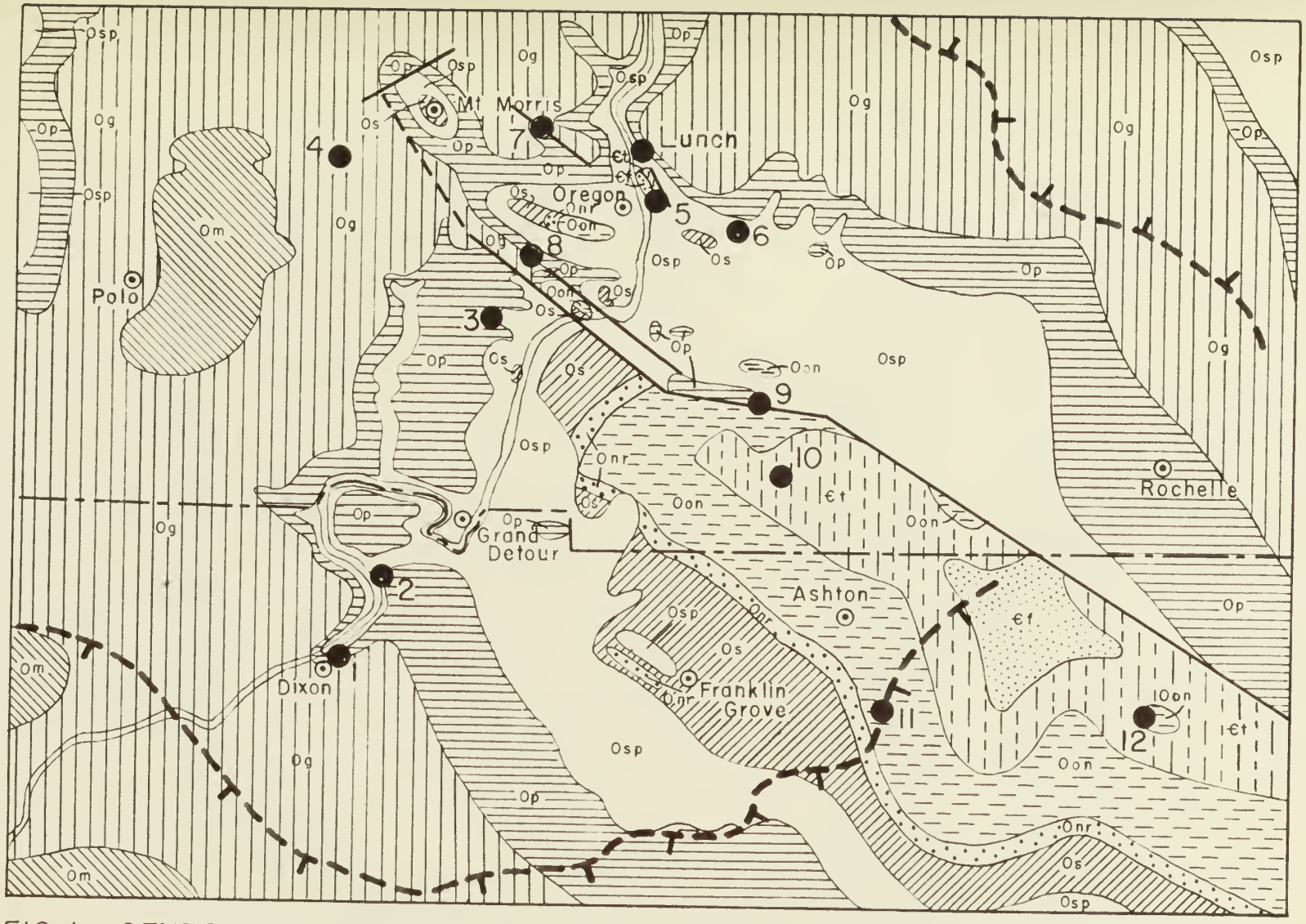


FIG. 1 – GENERALIZED BEDROCK MAP OF THE DIXON-OREGON-ROCHELLE AREA

SCALE 0 1 2 3 4 MILES

● 5 Stop, with number

——— Fault

T—T—T Boundary of Shelbyville (Tazewell) till

SIXTEENTH TRI-STATE GEOLOGICAL FIELD CONFERENCE

ANNOUNCEMENTS

Headquarters - Nachusa Hotel, Dixon, Illinois (see map, fig. 2).

General Schedule - The conference will assemble at 8 A. M. Saturday morning, October 11, at Stop 1, in Dixon, and will return to Dixon at 5:45 P. M. It will re-assemble at 8:30 A. M. Sunday morning at Stop 9, nineteen miles northeast of Dixon, and will disband at noon Sunday at Stop 12, six miles south of Rochelle. The entire trip has a length of 114 miles.

Annual Dinner Meeting - The annual dinner will be served by the Ladies Auxiliary of the First Presbyterian Church at the Loveland Community House, Dixon, on Saturday, October 11, at 7 P. M. Tickets ($1.75) will be distributed Saturday morning at Stops 1 and 2.

MAPS AND SECTIONS

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Topographic maps of the Dixon and Oregon quadrangles will be available for reference in the lead and rear cars.

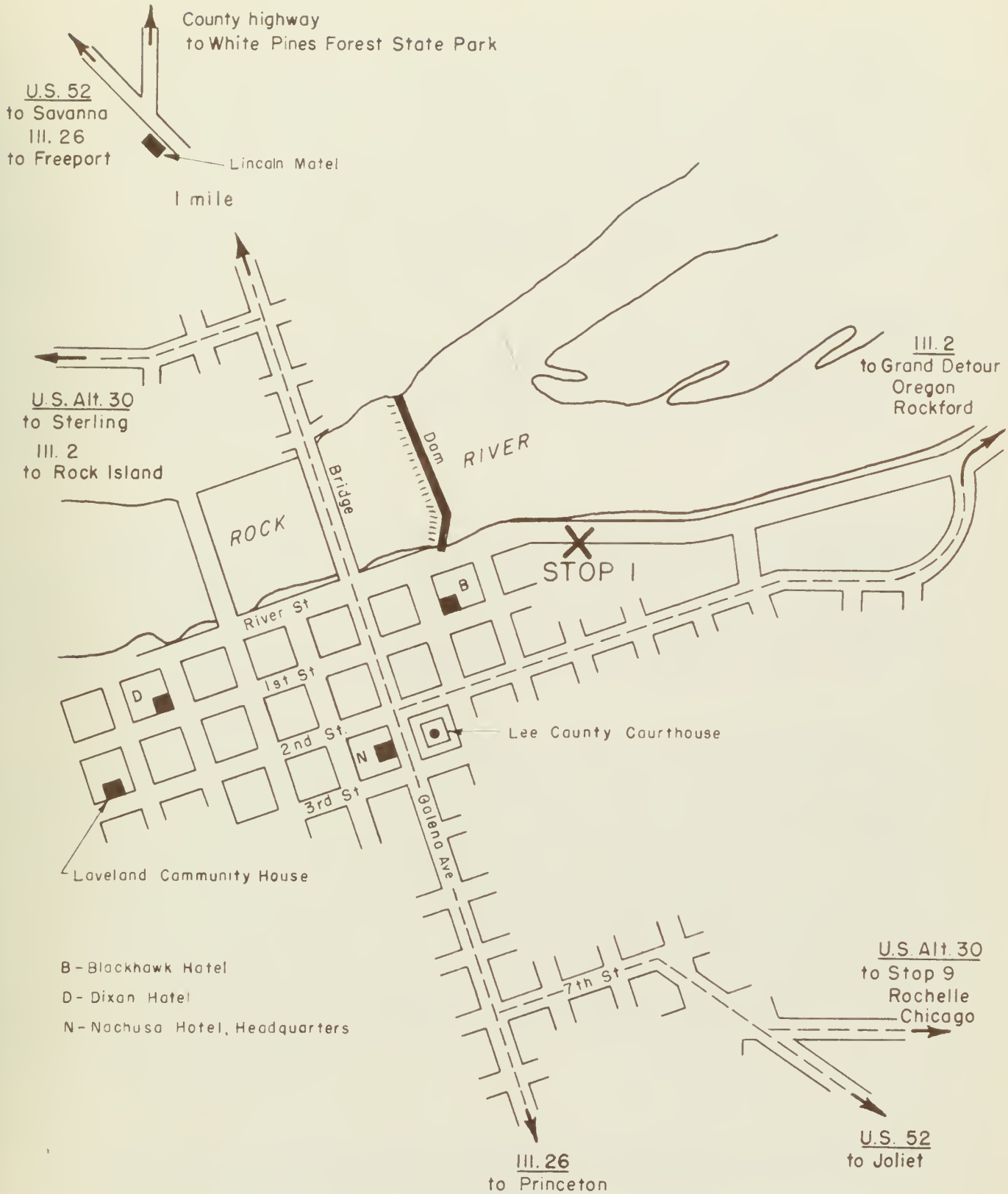

FIG. 2 - MAP OF DIXON, ILLINOIS

STRATIGRAPHY[1/]

The Dixon-Oregon area is underlain by about 3,700 feet of sedimentary strata. The lower 2,800 feet is Cambrian resting on pre-Cambrian granite and the upper 900 feet is Lower and Middle Ordovician (fig. 3). More than 96 percent of the sequence consists of dolomite and sandstone, and less than 4 percent, largely confined to the Cambrian Eau Claire formation and the Champlainian (Middle Ordovician) Glenwood subgroup, is composed of shale. The only limestone occurs in the Platteville group, chiefly around Dixon. Formations below the Franconia formation are known only from well cuttings, but the Franconia and all younger formations are exposed. Because of the regional southwestward dip, Upper Ordovician shale, Silurian dolomite, and Pennsylvanian sandstone are found within a distance of 15 miles to the west, but will not be examined on this trip.

The region is of particular stratigraphic interest because its isolated Cambrian and Lower Ordovician exposures are important in correlating the relatively near-shore Wisconsin sequence with the deeper-water Missouri sequence. Although many of the sandstones in the Wisconsin section grade southward into dolomite, the carbonate formations undergo relatively little change from north to south.

Champlainian Classification

Studies in progress since 1940 on both outcrops and well cuttings have shown that the classification of the Champlainian (Middle Ordovician) rocks of Illinois is not adequate for refined work, that it violates certain natural boundaries, and that it contains some miscorrelations. A revision of the classification is shown in figure 3. Although new stratigraphic names are given for convenience, the names are not formally introduced and defined in this guidebook, but will be brought out in a forthcoming paper.

The revised classification is based on detailed studies throughout Illinois and in the outcrop areas of surrounding states, and on reconnaissance studies in Kentucky, Tennessee, Virginia, Michigan, Ontario, and New York. These studies were made to determine the relative rank of the units, the persistence of physical breaks, the extent of facies change, and the correlation with the standard section of New York state. Although a great variety of lithologic, faunal, and diastrophic criteria have proved valuable in this study, the vertical variation in the relative degree of argillaceousness has been found to have the widest regional extent and to be most useful in differentiation of the carbonate sediments. Relatively minor differences in argillaceousness can be traced by matching sequences throughout much of the eastern United States and even into the marginal parts of the Appalachian geosynclinal areas, where the units thicken greatly. Differences in relative argillaceousness commonly extend through areas of carbonate facies-change and are believed to reflect regional diastrophic movements of a periodic or cyclic character.

1/ This guidebook contains considerable unpublished stratigraphic and structural information which is currently being prepared for publication.

Lateral gradation from dolomite to sandstone within short distances is common in the Ancell group of Illinois (St. Peter-Glenwood strata of northern Illinois), but in most of the higher beds facies change is gradual and moderate, and is not a major influence on classification. Regional evidence provided by the continuity of the lithologic succession, by bentonites, by erosion surfaces, and by faunal zones indicates that the formations and members in the new classification are essentially rock-time units which do not transgress time lines.

Several of the members which are thin and weakly differentiated in northern Illinois nevertheless are persistent and recognizable throughout most of the state, and greatly increase in thickness and distinctiveness in southern Illinois and Missouri. The Platteville group thickens to more than 600 feet in southern Illinois and the Glenwood equivalents to 400 feet, whereas the same sequence in the upper Mississippi valley commonly has a combined thickness of less than 100 feet.

The distinguishing characteristics of Galena-Platteville formations in the Dixon-Oregon area, listed below in descending order, supplement the data in figure 3.

GALENA GROUP

Dubuque, ± 30': dolomite, argillaceous, finely and coarsely crystalline, crinoidal, thin- to medium-bedded, shaly, with red flecks and red shale partings south and southeast of type area.

Wise Lake, ± 90': dolomite, pure in upper part, slightly argillaceous in lower part, brown, coarsely crystalline, vuggy, massively bedded.

Dunleith, ± 125': dolomite, pure and argillaceous in alternating units, cherty, medium crystalline, medium- to thick-bedded; has gray flecks, green shale partings, and Resserella toward base.

Guttenberg, ± 5': dolomite, argillaceous and finely crystalline to pure and coarsely crystalline, red-speckled and with red shale partings. Sowerbyella common.

Spechts Ferry, Missing: green shale and limestone with Pionodema in northwestern Illinois.

-- Unconformity --

PLATTEVILLE GROUP

Quimbys Mill, ± 12': dolomite, argillaceous and cherty, yellow buff, chalky, thin- to thick-bedded, with shale partings in middle.

Nachusa, ± 18': dolomite or limestone, pure except for argillaceous unit in middle, cherty, fucoidal, thick-bedded, with Foerstephyllum, Lichenaria, and Tetradium.

Grand Detour, ± 50': dolomite or limestone, alternately pure and argillaceous, partly cherty, thin- to thick-bedded, with some red shale partings. More dolomitic, less argillaceous and shaly, and thicker-bedded than underlying Mifflin formation.

Mifflin, ± 25': limestone or dolomite, alternately pure and argillaceous, non-cherty, thin- to thick-bedded, with gray-green shale partings.

Pecatonica, ± 30': dolomite and limestone, relatively pure, locally cherty, finely crystalline, and thick-bedded; is slightly argillaceous and has weak shale films in middle. Ferruginous corrosion surface at top; diastem and phosphatic nodules at base.

MAJOR EVENTS IN THE PLEISTOCENE HISTORY OF ROCK RIVER VALLEY

The preglacial Rock River (fig. 8), entrenched in the Lancaster peneplain, ran southward from Rockford to the vicinity of Princeton where it joined the southeastward-trending ancient Mississippi River. The preglacial Rock valley lay about 25 miles east of Dixon and was joined by three major eastward-flowing tributaries which followed the present valleys of the Pecatonica River, of Leaf River and Stillman's Run, and of Gale Creek and Kyte River. Pre-Illinoian Pine Creek ran southward for about 6 miles past Grand Detour, and then turned southwestward, passing south of Dixon to join the ancestral Rock River.

Although the pre-Illinoian history of this area is awaiting further study, the entire area was covered by the Illinoian ice sheet. When the Illinoian ice melted, the ancient Rock valley south of Rockford was filled with drift. The waters of Rock River backed up in the Leaf River - Stillman Run preglacial valley until they overtopped a narrow divide at Oregon, flowed into the preglacial valleys of Pine Creek and Elkhorn Creek, and thence ran southward to the ancestral Mississippi valley, which had been reoccupied. Erosion through the divide at Oregon produced the present deep narrow valley around the site of the Black Hawk statue. Because drift blocked Pine Creek valley south of Grand Detour, the post-Illinoian Rock River swung northward in a great loop and then ran west along its present route past Dixon to Sterling where it joined southward-flowing Elkhorn Creek. The flow of water in the Stillman and Kyte valleys was reversed, so that these streams now run westward to join the Rock.

The earliest Wisconsin glaciers, the Farmdale (inferred) and the Iowan, did not reach the Dixon-Oregon area, but the Shelbyville ice sheet, representing the initial advance of the Tazewell glaciation, invaded the eastern and southern parts of the area. The Belvidere lobe, advancing from the east, blocked the Sangamon course of Rock River between Rockford and Byron (fig.7) and forced the river westward, where it cut a deep gorge in Galena dolomite. This gorge is the youngest part of the present Rock valley. Although the Green River lobe advanced from the southeast across Rock River west of Dixon, the river appears to have found a route southwestward beneath the ice, along or close to its existing course. However, the Green River lobe diverted the ancient Mississippi River westward to its present position.

During later Tazewell glaciation, when the Bloomington moraine was deposited, a broad area on the south side of Rock valley was covered with outwash which consisted mainly of pebbly sand.

The Green Bay lobe of the Valparaiso (Cary) glaciation reached Janesville, Wisconsin, and built a valley train of sand and gravel in Rock valley. Deposition of this material reduced the topographic relief of the valley by about 100 feet. The surface of this valley train is about 45 feet above the present flood plain. Subsequent down-cutting of the Mississippi and Rock valleys and deposition of an early Mankato valley train produced a lower terrace about 20 feet above the present flood plain of Rock River.

[illegible]

STRUCTURE

The Dixon-Oregon area (figs. 5 - 6) exhibits unusually numerous, complex, and intense structures for the upper Mississippi valley. Folds having surface dips of from 10° to 30° are common, although such dips are of short lateral extent. More than sixty faults having throws of from 5 to 350 feet are known in the area, and at least two of these are thrust faults.

The major structure of the area is the Ashton arch, a broad, high anticline which brings formations as old as Franconia to the bedrock surface, and which extends from Kendall County northwestward for 80 miles to Rock River between Oregon and Dixon. The arch is bounded along its northern side by the Sandwich fault, which has a maximum downthrow of 900 feet on the north side, east of the Dixon-Oregon area.

The Oregon anticline, a branch of the eastward-trending Savanna-Sabula anticline, parallels the north side of the northwestern part of the Ashton arch and is separated from it by a narrow graben or syncline. West of Rock River the west end of the Ashton arch and the west flank of the Oregon anticline plunge abruptly into the Polo basin, which preserves rocks as young as the Maquoketa shale (Cincinnatian). A dome called the Brookville uplift rises from the east end of the Savanna-Sabula axis, just northwest of the Polo basin.

The LaSalle anticline is sharply defined as far north as southeastern Lee County, where it merges with the southwest flank of the Ashton arch. However, the anticline seems to reappear in the Dixon area, separates the Polo basin from Illinois basin on the south, and finally merges with the Savanna-Sabula anticline.

The Wisconsin arch is separated from the Dixon-Oregon area by a syncline on the north side of the Savanna-Sabula anticline.

Although many of these structures were active in Lower and Middle Ordovician time, and faulting with at least 235 feet of throw occurred in pre-St. Peter time, evidence in other areas indicates that the major movements along the structures were in post-Mississippian - pre-Pennsylvanian time and in the late Pennsylvanian or Permian periods.

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FORMER CLASSIFICATION — REVISED CLASSIFICATION

SERIES	FORMATION	MEMBER	STOP NO.	ROCK COLUMN	MEMBER	FORMATION	GROUP	SERIES	CORRELATION WITH NEW YORK			LITHOLOGY IN ILLINOIS	THICKNESS (FT.)
MOHAWKIAN SERIES	Galena	Dubuque				Dubuque	GALENA GROUP	CHAMPLAINIAN SERIES	TRENTON GROUP	Cobourg fm.	Hillier	Thin-bedded, shaly	32
		Stewartville	8		Stewartville	Wise Lake					Steuben mbr.	Pure, massive; Recepts.	50
					Sinsinawa							Slightly arg. thick-bd.	40
		Prosser	4		Wyota	Dunleith					Rust mbr.	Dunleith members are argillaceous at top and purer below; Buckhorn - St. James members have dark gray flecks and green shale partings. Overlying Wise Lake fm. is non-cherty and much purer.	19
					Wall								9
					Sherwood					Denmark	Russia		10
					Rivoli						Poland		16
			7		Mortimer						Rathbun		12
					Fairplay					Shoreham fm.			16
					Eagle Point								15
					Beecher					Hull fm.	Tetradium Beds		4
	Decorah	Ion	1, 7, 8		St. James						Crinoid Beds		18
					Buckhorn	Red Cliff							6
		Guttenberg			Glenhaven	Gutten-berg				Rockland	Napanee mbr.	Red-speckled, med.-b'd.	3
					Garnavillo							Thin-b'd., red shale ptgs.	2
	Platteville	Spechts Ferry			(Absent)	Spechts Fy.					Selby	Green shale and ls.	0
					Strawbridge	Quimbys Mill	PLATTEVILLE GROUP		BLACK RIVER GROUP		Absent	Fucoidal, medium-b'd.	5
			1, 8		Shullsburg							Thin-bedded, shaly	5
					Hazel Green							Whitish, thick-bedded	2
		Magnolia	8		Everett	Nachusa				Chaumont	Water-town	Fucoidal, cherty, massive	8
					Elm						Glen-burnie	Argillaceous, med.-b'd.	3
					Eldena						Leray	Fucoidal, thick-bedded	8
					Forreston	Grand Detour				Lowville formation	Upper Lowville mbr.	Thin-bedded, shaly	25
					Victory							Pure, thick-bedded	1
					Hely							Thin-bedded, shaly	4
					Clement							Calcarenite, massive	0
					Stillman							Fucoidal, massive	7
					Walgreen						Lower Lowville mbr.	Thin-bedded, shaly	8
					Dement							Pure, thick-bedded	8
		Mifflin	2, 8, 9		Briton	Mifflin						Thin-bedded, shaly	10
					Hazelwood							Fucoidal, thick-bedded	6
					Establish-ment							Thin-bedded, shaly	3
					Boarman	Transpose Names						Pure, medium-bedded	2
					Brickeys							Thin-bedded, shaly	5

FIG. 3-(Upper Half) - BEDROCK COLUMNAR SECTION FOR DIXON-OREGON AREA

FORMER CLASSIFICATION

REVISED MIDDLE ORDOVICIAN CLASSIFICATION
PRESENT LOWER ORDOVICIAN AND CAMBRIAN CLASSIF.

SERIES	FORMATION	MEMBER	STOP NO.	ROCK COLUMN	MEMBER	FORMATION	GROUP	SERIES	CORRELATION WITH NEW YORK OR MISSOURI			LITHOLOGY IN ILLINOIS	THICKNESS (FT.)
MOHAWKIAN	Platteville	Pecatonica	2,8,9		Oglesby	Pecatonica	PLATTEVILLE	CHAMPLAINIAN	BLACK RIVER GROUP	Lowville fm	Lower Lowville mb	Calcarenite, thick-b'd.	0
					Medusa							Thick-bd, weakly shaly	7
					New Glarus							Pure, massive	3
			2,3,9		Dane							Slightly arg. and shaly	15
					Chana							Pure, sandy, thick-bd.	6
					Hennepin							Argillaceous, silty	0-1
	Glenwood		3		Harmony Hill fm	Glenwood subgroup	ANCELL				Pamelia fm	Shale, green, sandy	6
					Loughridge fm							Silty, fine and coarse	8
					Daysville fm							Arg., silty, sandy	5
					Kingdom fm							Silty, fine and coarse	9
CHAZYAN	St. Peter fm		3,5			St. Peter						Pure, well-sorted	200
					(Absent)		1/					Everton (Chazy.)	Dolomite and Sandstone	0
							PR. DU CHIEN	CANADIAN				Powell	Dolomite	0
												Cotter	Dolomite	0
						Shakopee						Jefferson City	Cherty, sandy, thin-b'd.	100
						New R'ich.						Roubidoux	Slightly arg. locally dolc.	30
ORDOVICIAN			12			Oneota						Gasconade	Coarsely Xtln. thick-b'd	150
						Gunter						(Gunter mb)	Arg. dol., sh. and ss.	25
CAMBRIAN												Eminence	Sandy, cherty, gray	22
			10,12			Trempeleau						Potosi	Pure, buff, vuggy	80
			5									Derby-Doe Run	Silty, sandy, glauc.	50
						Franconia						Davis	Ss, dolc., glauc., shaly, with dolomite in middle	90
						Ironton	Unnamed					Lower Davis and Upper Bonneterre?	Dolc., poorly sorted	100
						Galesville							Pure, well sorted	50
						Eau Claire						Bonneterre	Dol., shale and ss.	450
			Unexposed		Charter	Mt. Simon	Dresbach	St. Croixian				Lamotte	Ss., conglomeratic	255
					Gunn								Ss., non-conglomeratic	70
					Lacey								Ss., conglomeratic	175
					Mayfield								Ss., partly congl.	335
					Lovell								Ss., non-conglomeratic	90
					Kenyon								Ss., conglomeratic	115
					Crane								Ss., non-congl., arkosic	945
					Pre-Cambrian granite									

1/ Everton group of probable Chazy age in Southern Illinois

FIG. 3 (LOWER HALF) - BEDROCK COLUMNAR SECTION FOR DIXON-OREGON AREA

STAGE	SUBSTAGE	DRIFT	COLUMN	MAXIMUM THICKNESS	LITHOLOGY
RECENT	MANKATO	Lake Chicago			
WISCONSIN	CARY	Lake Border Tinley			Tills present in Chicago area
		Valparaiso		110'	Valley-train gravel and sand along Rock River; loess?
		Manhattan- Rockdale Minooka			Tills present in Joliet area
	TAZEWELL	Marseilles through Normal		loess	Present southeast of area
		Metamora- Bloomington		150'	Till, outwash, and loess, present at SE. margin of area; Bloomington till is pink and sandy
		Leroy?		100'	Till, buff, clayey, leached to about 4 feet; valley-train and loess; present at SE. margin of area
		Shelbyville (Green River Lobe)-Stop II		60'	Till, buff, clayey, leached to about 4½ feet; occupies southern part of area
	IOWAN				Missing except for loess 1/
	FARMDALE (Pre-Wisconsin)				Thin or absent
SANGAMON (interglacial)				5'+	Alluvial silts beneath soil; Illinoian till weathered to gumbotil
ILLINOIAN (glacial)	BUFFALO HART				
	JACKSONVILLE			200'	Till, leached to 8'-12'; has pebbles of Huronian jasper-conglomerate
	PAYSON	Stops 6, 11			
	LOVELAND (Pre-Illinoian)			15'+	Silveria pro-Illinoian lake silt
YARMOUTH (interglacial)				8'+	Alluvial clay with carbonized plant frags. in pre-Ill. valleys
KANSAN (glacial)					
AFTONIAN (interglacial)					Missing
NEBRASKAN (glacial)					

1/ Beyond the Tazewell drift-margin Iowan loess and later loess is undifferentiated and is called Peorian

FIG. 4 - COLUMNAR SECTION OF PLEISTOCENE DEPOSITS IN THE DIXON-OREGON AREA

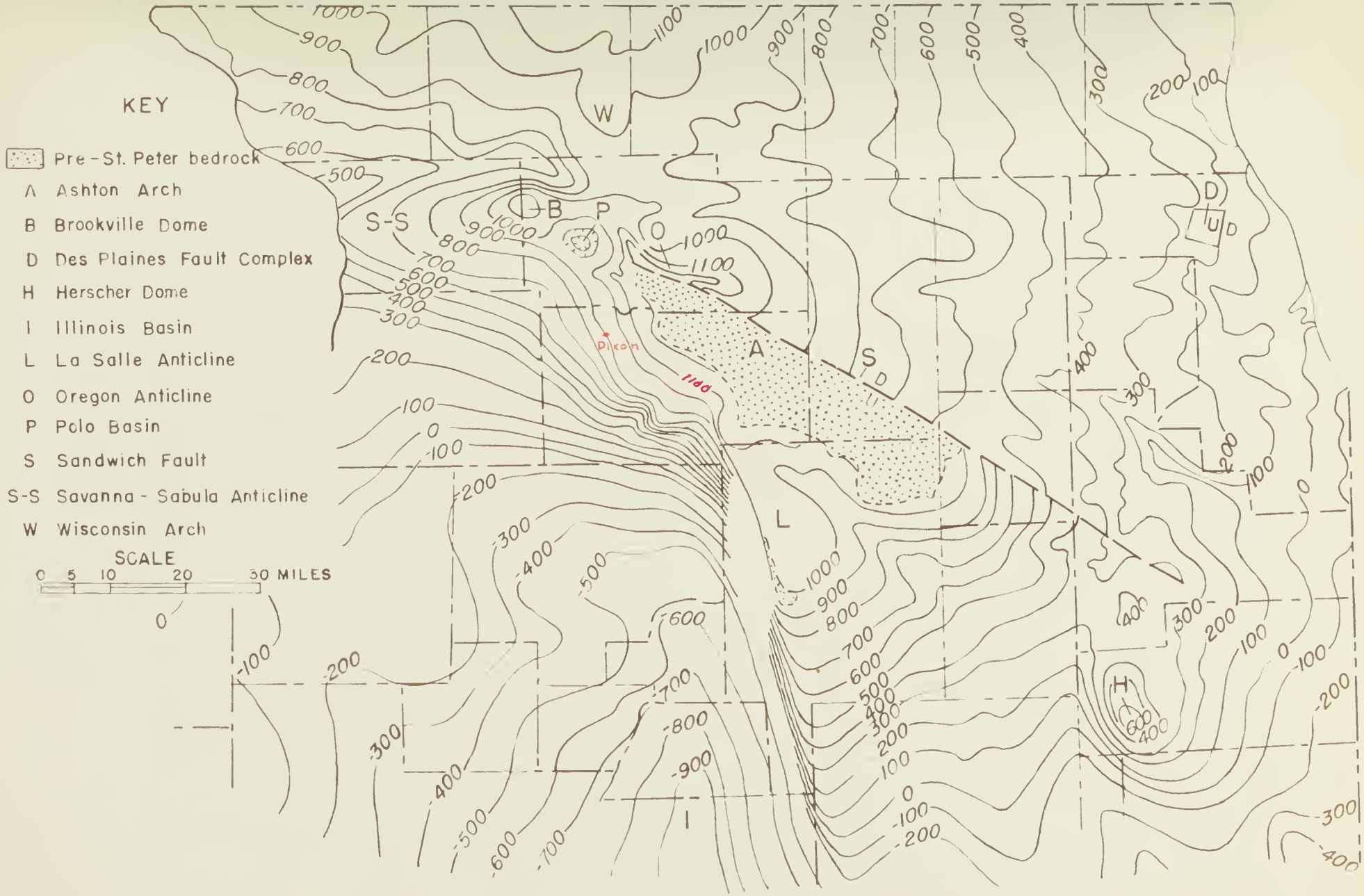


FIG. 5 - STRUCTURE CONTOURS ON TOP OF THE GALENA DOLOMITE IN NORTHERN ILLINOIS
(after Horberg)

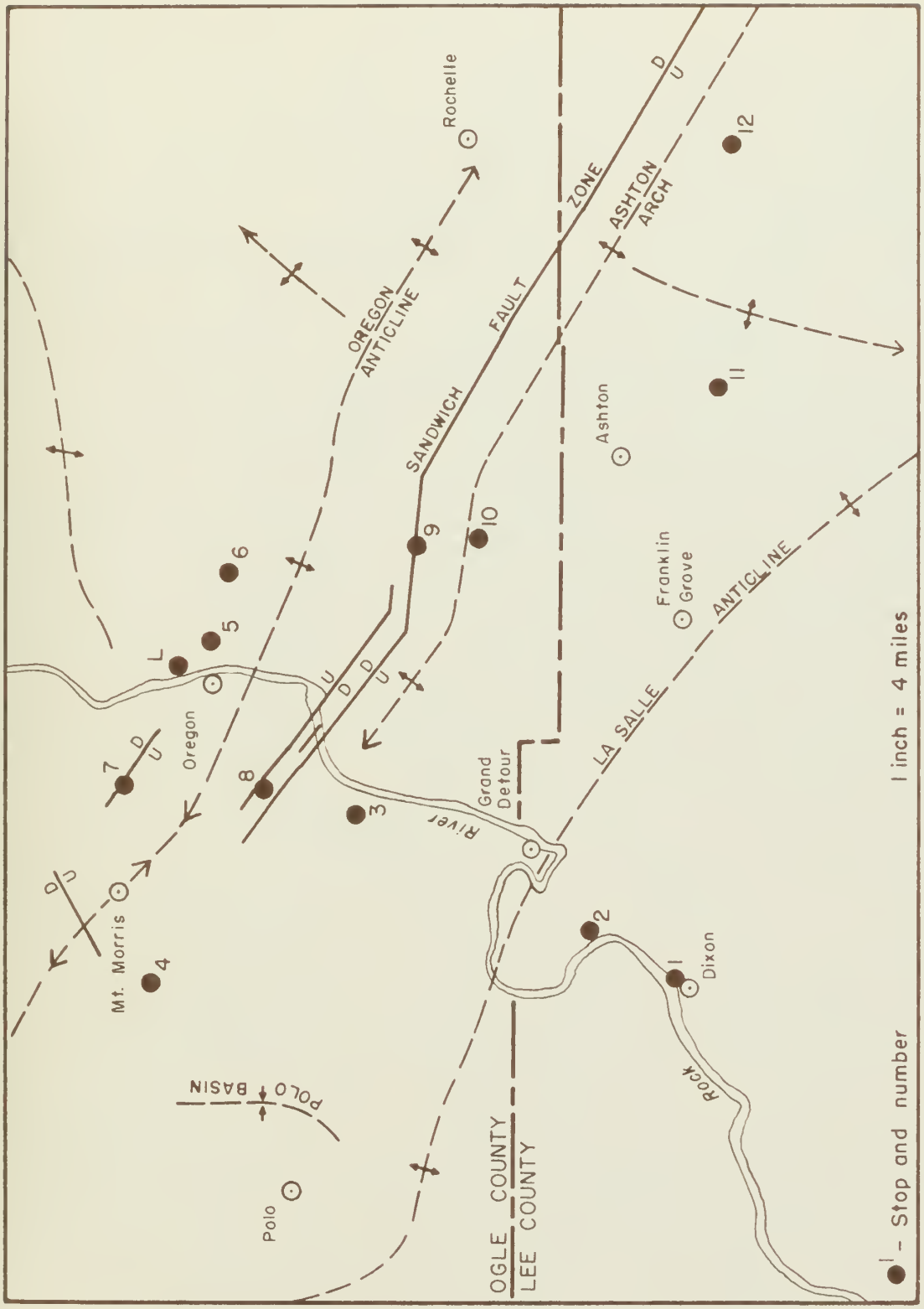
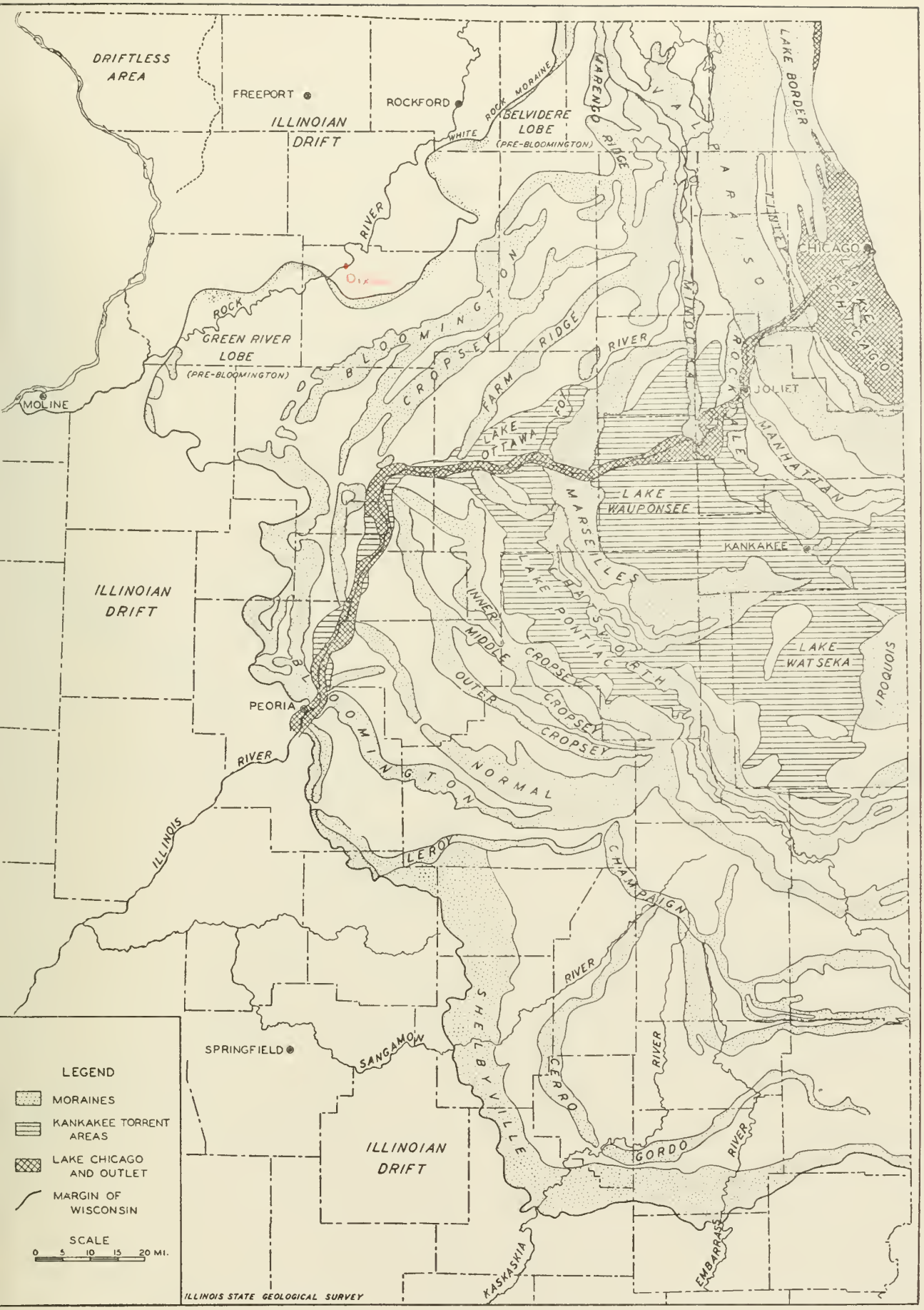


FIG. 6- MAJOR STRUCTURAL FEATURES OF THE DIXON-OREGON AREA



GLACIAL GEOLOGY IN NORTHEASTERN ILLINOIS
Compiled by George E. Ekblaw from data furnished by the Survey
January 1, 1942

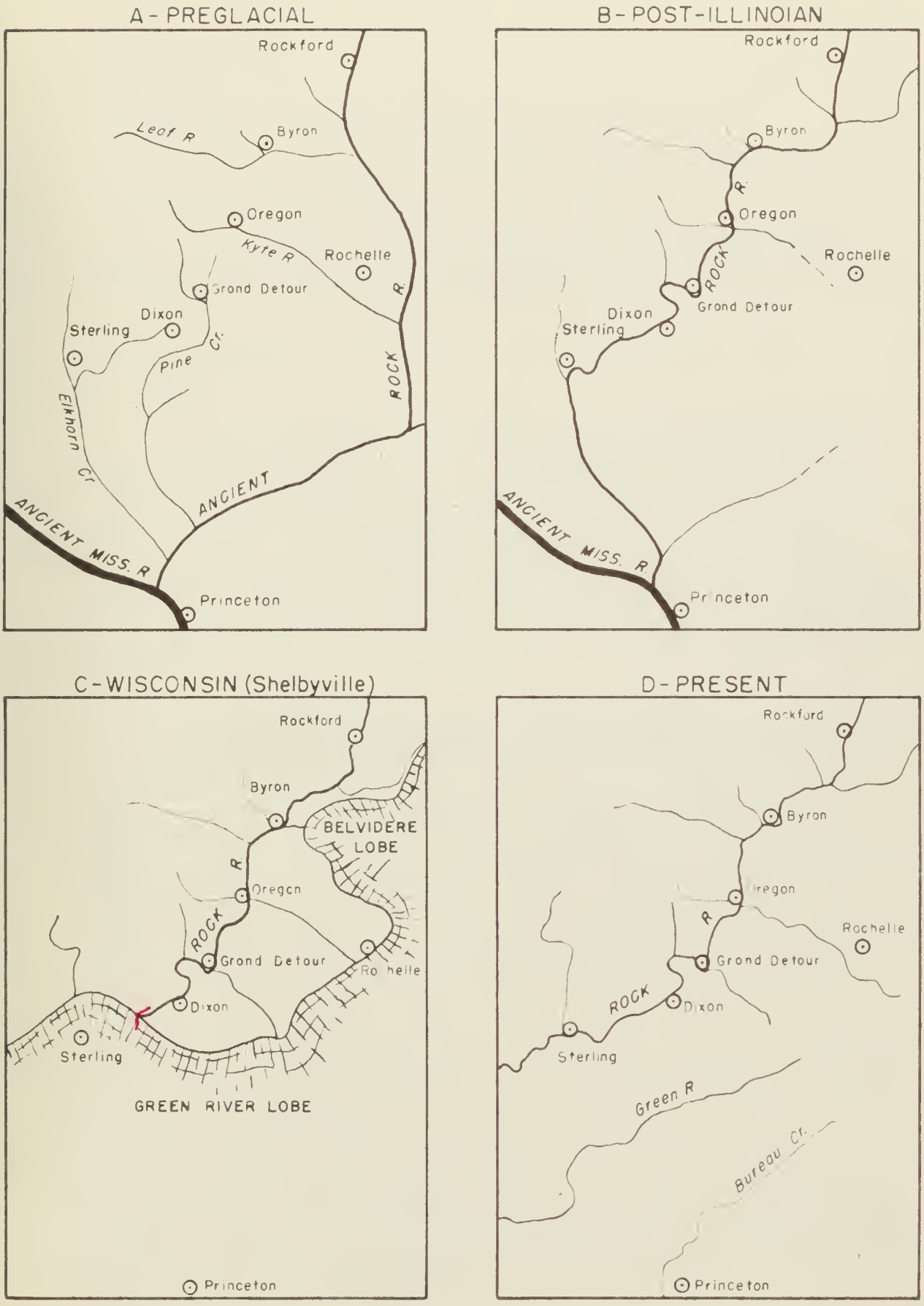


FIG. 8 - PLEISTOCENE HISTORY OF ROCK VALLEY

ITINERARY FOR SATURDAY, OCTOBER 11, 1952 (FIRST DAY)

Mileage

Assemble at Stop 1 on River Street 1/2 mile east of highway bridge over Rock River on the south side of the river (fig. 2).

0.0 STOP 1 - RIVER STREET - UPPER PLATTEVILLE AND LOWER GALENA STRATA. Abandoned quarry in SE.¼ SE.¼ SE.¼ Sec. 32 and SW.¼ SW.¼ SW.¼ Sec. 33, T. 22 N., R. 9 E., Lee County (Dixon quadrangle).

Discussion Leaders: H. B. Willman and J. S. Templeton

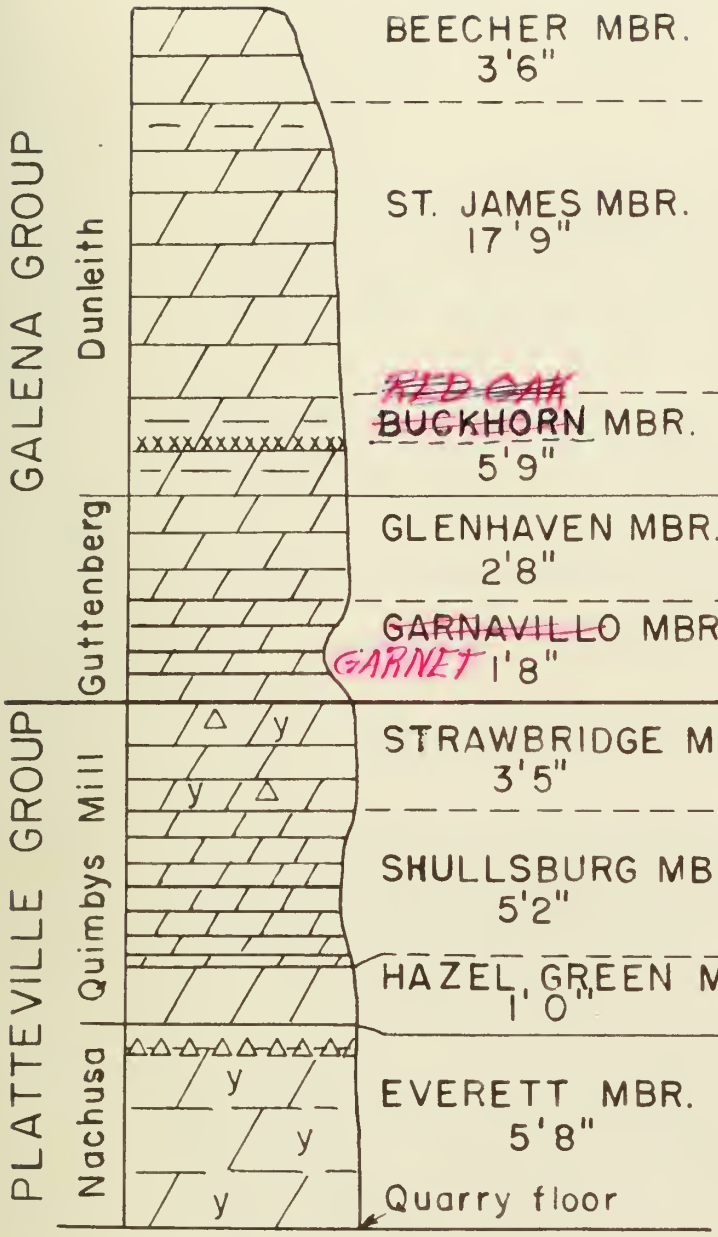
See figure 9.

In the dolomite facies Galena (Trenton) beds generally are more coarsely crystalline, more porous, and thicker-bedded than Platteville (Black River) strata. The Buckhorn and St. James members ("Blue" and "Gray" members of the zinc-lead district) grade laterally into the Ion green shale member of the Decorah formation north of Guttenberg, Iowa. The Prasopora zone at the top of the Ion extends eastward in the dolomite facies to Rockford, Illinois, but has not been found this far south. The basal Galena Spechts Ferry formation wedges out eastward and here is absent above the unconformable contact between the Platteville and Galena groups. At this locality the beds dip gently westward.

Historical Note on Dixon (population 11,523): In 1830, John Dixon, for whom the town is named, operated a ferry and tavern at Dixon for travelers from Peoria to the lead mines around Galena, Jo Daviess County, northwestern Illinois. In 1832, during the Black Hawk War, infantry and militia stationed at Dixon included Jefferson Davis, Abraham Lincoln, Gen. Winfield Scott, Zachary Taylor, and Robert Anderson of Fort Sumter fame. Lincoln spoke at the Court House square during the presidential campaign of 1856. The geology of the Rock River valley was described first in 1861 by Dr. Oliver Everett of Dixon, a pioneer physician. Present Dixon industries include the manufacture of cement, wire cloth, electric power and gas, shoes, industrial chains and valves, caskets, garage doors, cereals, feeds and condensed milk. The Green River Ordnance Plant is six miles south.

0.4 STOP SIGN - at intersection of River Street and Illinois State Highway No. 2. Turn left (east) on Ill. 2. The Nachusa formation is exposed in the road cut on the southeast corner of the intersection. For the next mile the route crosses a valley train terrace of Mankato age.

1.4 CAUTION - Turn left (north) onto black-top road past west side of Medusa Portland Cement Plant, leaving Ill. 2. Cement is manufactured from the Mifflin limestone which is quarried north of the plant. The limestone is mixed with overlying Peorian loess (well exposed in recent cuts just east of the turn) and with Pennsylvanian shale brought by rail from mine dumps near LaSalle.



Dolomite, pure, nonshaly, noncherty, thick bedded.

Dolomite with weak green shale partings, argillaceous, whitish, and dense at top, but less argillaceous and shaly than underlying ~~Buckhorn~~ Red Oak member. Resserella is common in Buckhorn - St. James beds.

Dolomite, argillaceous, with green shale partings; bentonite 3" above base; weak bedding break at top.

Dolomite, red speckled, medium-bedded with Sowerbyella and Cyrtodonta.

Dolomite, thin-bedded, with red shale partings and Sowerbyella.

Dolomite, fucoidal, cherty, medium-bedded, with Opikina.

Dolomite, thin-bedded, with shale partings and Opikina.

Dolomite, whitish-weathering, massive where fresh, nonshaly.

Dolomite, fucoidal, massive, with "white bed" and chert band at top, Foerstephyllum common.

FIG. 9 - STOP 1

Mileage

3.3 STOP 2 - DIXON NORTH - LOWER PLATTEVILLE STRATA.

Abandoned quarry on east side of road, SW.¼ SW.¼ NW.¼ Sec. 22, T. 22 N., R. 9 E., Lee County (Dixon quadrangle).

Discussion Leader: J. S. Templeton

See figure 10.

The top of the Pecatonica formation in the Tri-State region generally is marked by a ferruginous pitted corrosion surface, absent at Dixon North, but well developed at Stop 9. The Oglesby calcarenite, the youngest member of the Pecatonica formation, is absent in the upper Mississippi valley north of LaSalle, Illinois.

3.7 Turn right (east) on gravel road. The broad southwestward-trending depression on the right (south) side of the road is the abandoned channel of a tributary to pre-Illinoian Pine Creek. This tributary was blocked during the Illinoian glaciation by the Grand Detour esker.

4.8 Turn right (southeast) on gravel road. The Grand Detour esker rises from 30 to 70 feet above south (right) side of road for next mile.

5.8 STOP SIGN - Junction with Illinois State Highway No. 2. Turn left (north) on Ill. 2.

5.9 St. Peter sandstone is exposed in road cut on left (west) side of highway.

6.0 Cross Rock River. Half a mile west of the highway bridge the river swings two miles northward in a great loop which interrupts its general southwestward course and was named Grand Detour ("Big Bend") by 18th century French fur traders. The northward diversion of the river was caused by deposition of Illinoian drift in a preglacial channel south of Grand Detour.

6.6 Historical Note on Grand Detour (population about 250): Monument to Leonard Andrus and John Deere, who manufactured the first steel moldboard plow in 1837 at this spot in the village of Grand Detour (founded 1836). Prior to the invention of the steel plow, farming was largely confined to alluvial bottoms because wooden plows with cast iron tips and edges could not cut the tough mat of prairie grasses on the uplands. Deere later established an independent factory at Rock Island. Andrus' factory was later acquired by the J. I. Case Company and moved to Dixon, where plows were manufactured until 1927. The Case works is now located at Rockford.

6.7 Turn left (west) at sign pointing to Colonial Inn.

6.8 St. Peter's Episcopal Church, the first Episcopal Church established west of Chicago, built in 1849 and still in use, is on the left (south).

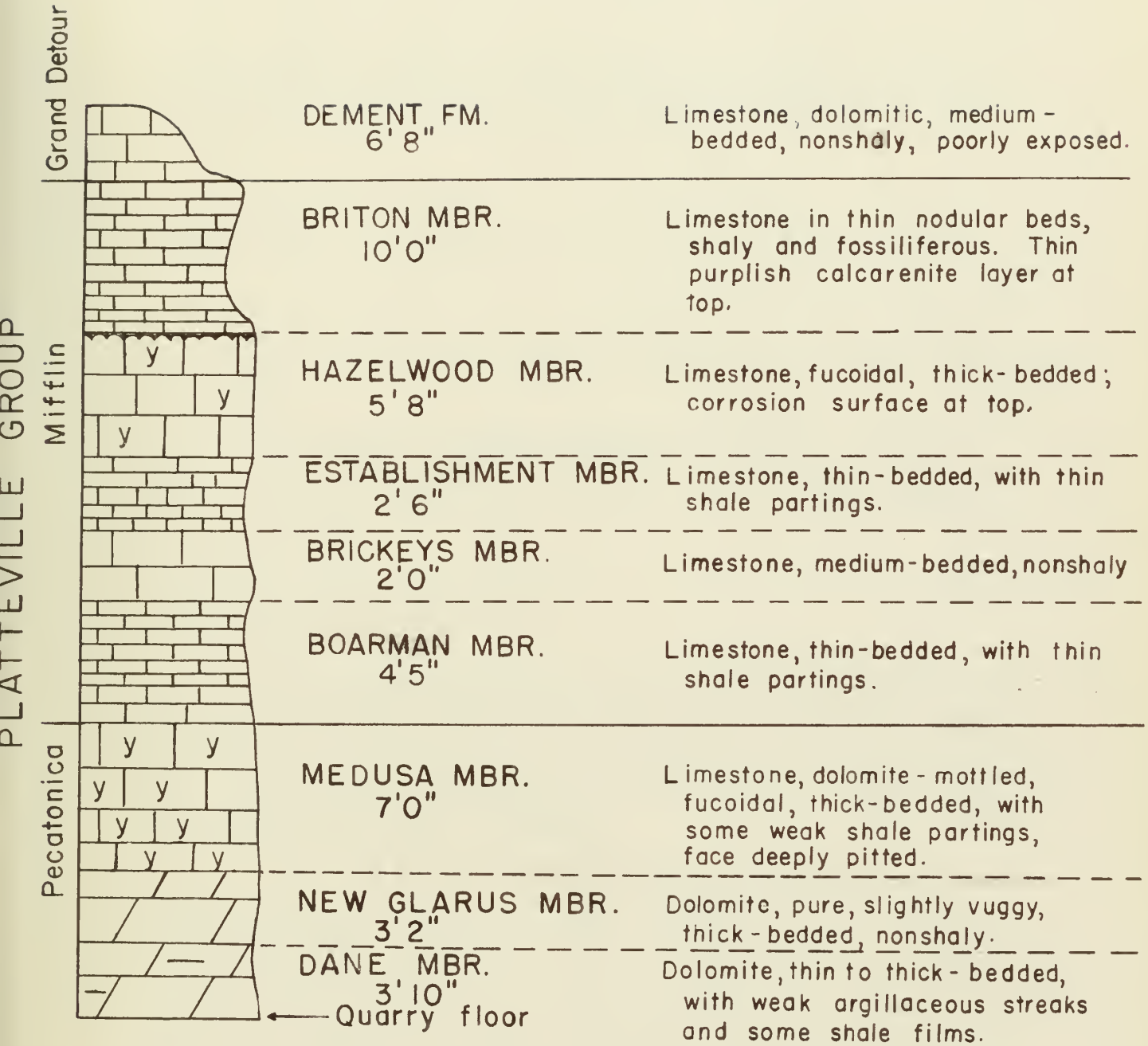

PLATTEVILLE GROUP
Grand Detour
Mifflin
Pecatonica
DEMENT FM.
6'8"
Limestone, dolomitic, medium-bedded, nonshaly, poorly exposed.
BRITON MBR.
10'0"
Limestone in thin nodular beds, shaly and fossiliferous. Thin purplish calcarenite layer at top.
HAZELWOOD MBR.
5'8"
Limestone, fucoidal, thick-bedded; corrosion surface at top.
ESTABLISHMENT MBR.
2'6"
Limestone, thin-bedded, with thin shale partings.
BRICKEYS MBR.
2'0"
Limestone, medium-bedded, nonshaly
BOARMAN MBR.
4'5"
Limestone, thin-bedded, with thin shale partings.
MEDUSA MBR.
7'0"
Limestone, dolomite-mottled, fucoidal, thick-bedded, with some weak shale partings, face deeply pitted.
NEW GLARUS MBR.
3'2"
Dolomite, pure, slightly vuggy, thick-bedded, nonshaly.
DANE MBR.
3'10"
Dolomite, thin to thick-bedded, with weak argillaceous streaks and some shale films.
Quarry floor

FIG. 10 – STOP 2

Mileage

6.9 Turn right (north) at Colonial Inn.

7.2 St. Peter sandstone is exposed in low cuts along the road.

7.5 In cuts along the road ascending the north valley wall of Rock River, the Loughridge (Lō'-ridge) sandstone and Harmony Hill shale of the Glenwood subgroup are overlain by Pecatonica and Mifflin dolomites. The bedrock is capped by 4 to 5 feet of Peorian loess.

8.0 Turn right (north) at fork in road, onto Ridge Road.

8.5 Quarry on right (east) side of road in lower part of Platteville dolomite.

12.1 Turn right (east) into farm lane at mail box marked "E. E. Lindsey."

12.4 Park at end of lane. Walk 600 feet to head of second ravine northeast of farmhouse.

STOP 3 - HARMONY HILL - GLENWOOD AND BASAL PLATTEVILLE STRATA.

Ravine in SE.¼ NE.¼ NE.¼ Sec. 24, T. 23 N., R. 9 E., Ogle County (Dixon quadrangle).

Discussion Leader: J. S. Templeton

See figure 11.

The Glenwood subgroup is characterized by green clay-glauconite, by poorly sorted sand made up of very fine angular grains and medium or coarse well-rounded grains, and by accessory garnets. Fine grains are relatively rare. The subgroup is unconformable on the pure , well-sorted St. Peter sandstone, which has a tourmaline-zircon heavy mineral suite, and is separated by a diastem or unconformity from the overlying Platteville formation.

Although the Glenwood formations shown in figure 11 occur throughout the Dixon-Oregon area, and although some extend widely through the upper Mississippi valley, they appear to have a facies relation when traced regionally. To the north and east, the Daysville dolomite laterally replaces the shale and sandstone. To the west, the Daysville lenses out and the two sandstones merge into a single unit beneath the Harmony Hill shale. To the south, the Glenwood subgroup grades into sandstone like the underlying St. Peter, but is much more coarse-grained. Still farther south this coarse-grained sandstone grades laterally into the lower Joachim dolomite and the Dutchtown limestone of Missouri.

12.4 Turn around and return to Ridge Road.

12.7 Turn right (north) on Ridge Road.

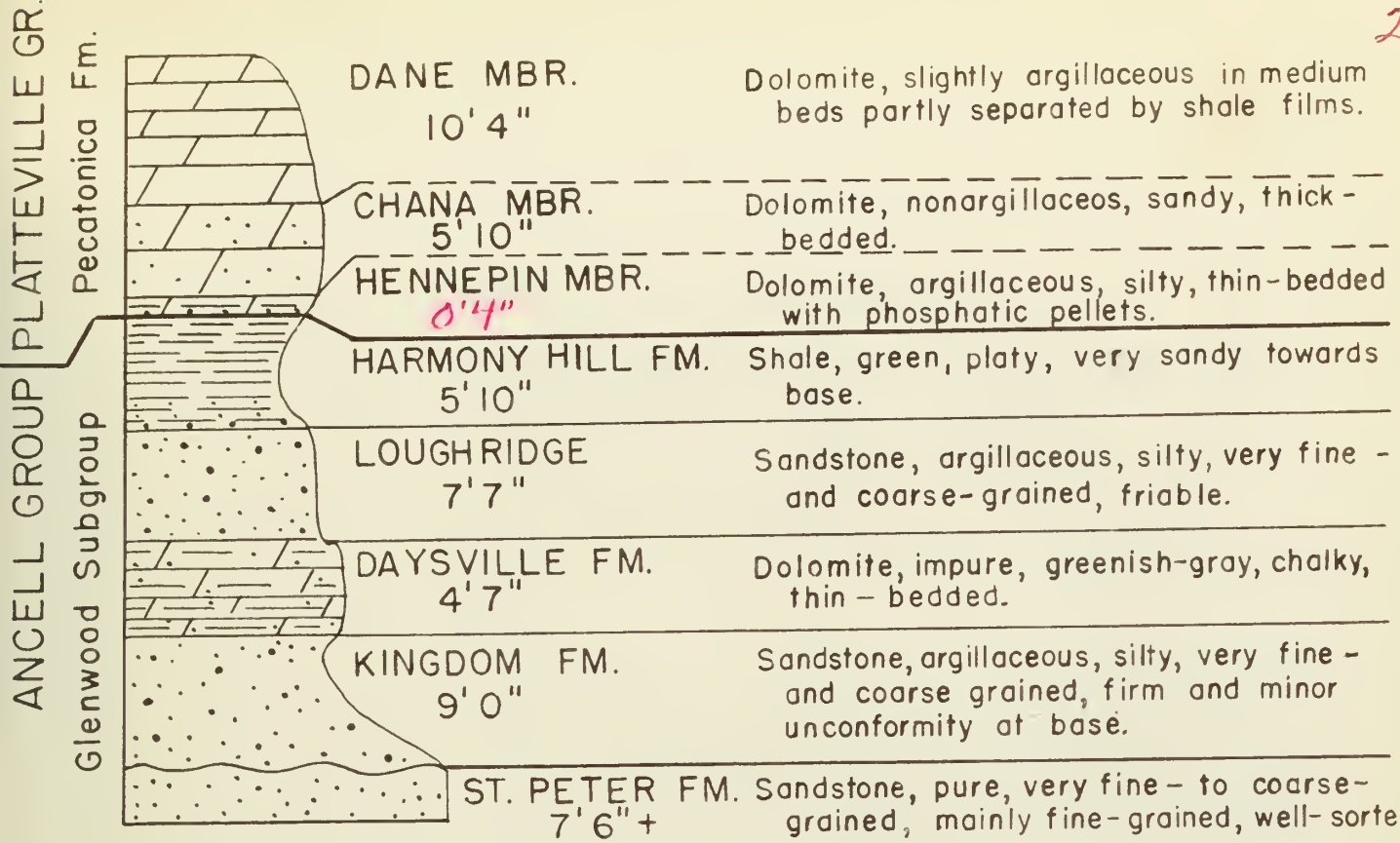
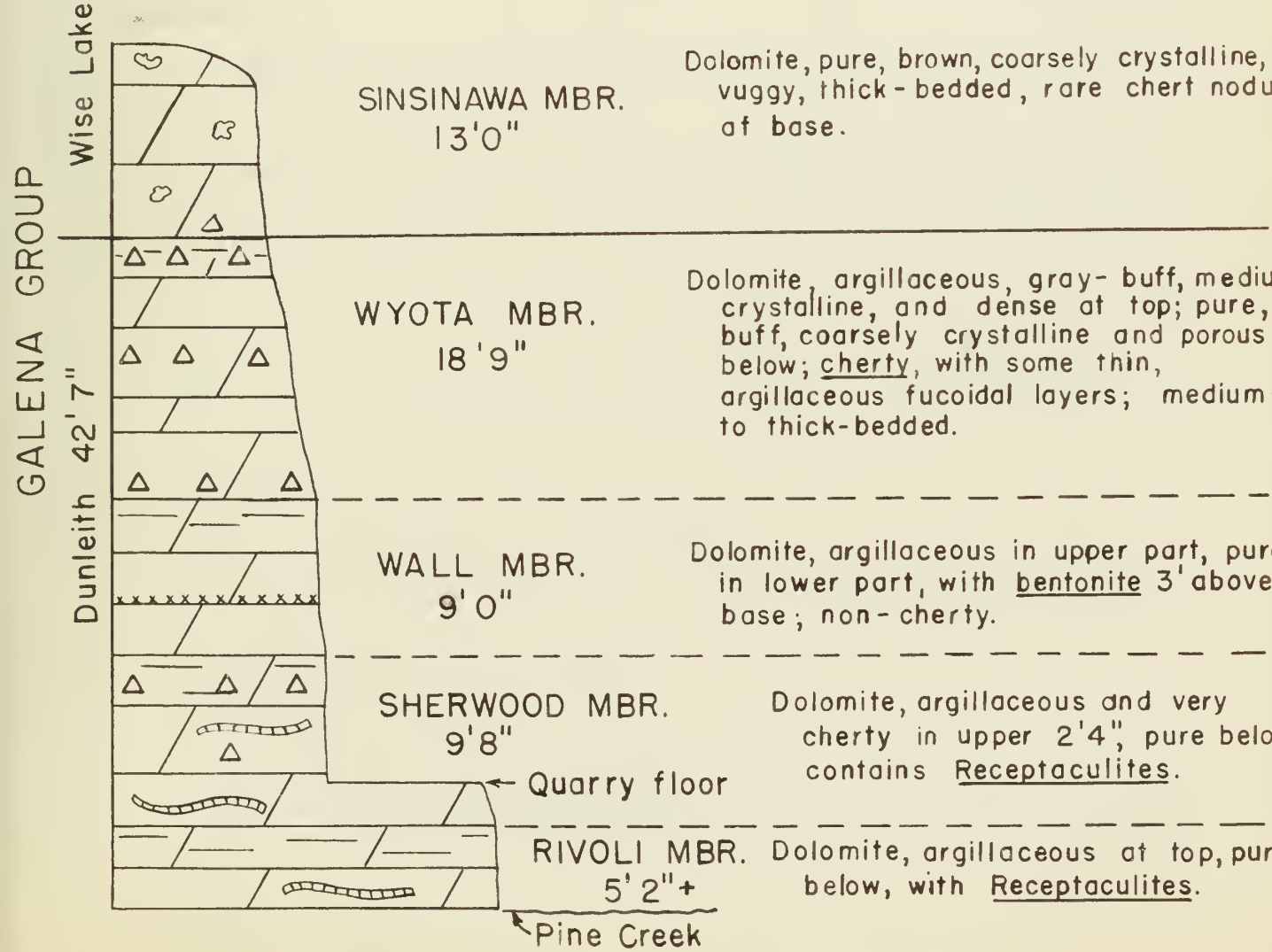

PLATTEVILLE GR.
ANCELL GROUP
Pecatonica Fm.
Glenwood Subgroup
DANE MBR. 10'4"
Dolomite, slightly argillaceous in medium beds partly separated by shale films.
CHANA MBR. 5'10"
Dolomite, nonargillaceos, sandy, thick-bedded.
HENNEPIN MBR. 0'4"
Dolomite, argillaceous, silty, thin-bedded with phosphatic pellets.
HARMONY HILL FM. 5'10"
Shale, green, platy, very sandy towards base.
LOUGHRIDGE 7'7"
Sandstone, argillaceous, silty, very fine- and coarse-grained, friable.
DAYSVILLE FM. 4'7"
Dolomite, impure, greenish-gray, chalky, thin-bedded.
KINGDOM FM. 9'0"
Sandstone, argillaceous, silty, very fine- and coarse grained, firm and minor unconformity at base.
ST. PETER FM. 7'6"+
Sandstone, pure, very fine- to coarse-grained, mainly fine-grained, well-sorted.

FIG. II- STOP 3


GALENA GROUP
Wise Lake
Dunleith 42'7"
SINSINAWA MBR. 13'0"
Dolomite, pure, brown, coarsely crystalline, vuggy, thick-bedded, rare chert nodules at base.
WYOTA MBR. 18'9"
Dolomite, argillaceous, gray-buff, medium-crystalline, and dense at top; pure, buff, coarsely crystalline and porous below; cherty, with some thin, argillaceous fucoidal layers; medium- to thick-bedded.
WALL MBR. 9'0"
Dolomite, argillaceous in upper part, purer in lower part, with bentonite 3' above base; non-cherty.
SHERWOOD MBR. 9'8"
Dolomite, argillaceous and very cherty in upper 2'4", pure below, contains Receptaculites.
Quarry floor
RIVOLI MBR. 5'2"+
Dolomite, argillaceous at top, purer below, with Receptaculites.
Pine Creek

Mileage

14.0 STOP SIGN - Turn left (west) on county black-top road.

14.5 Platteville and Galena dolomites which dip northwestward and which are cut by a fault striking northwest are exposed in a quarry on the right (north) side of the road and the east side of the stream.

15.6 Illinoian high-level terrace gravels form two knolls $\frac{1}{4}$ mile south of the road, on the east side of the stream.

17.0 Galena (Dunleith) dolomite is exposed in the east bank of Pine Creek, on both sides of road.

17.1 Entrance to White Pines State Park on right (north). Continue straight ahead. The pines in this park are believed to represent the southernmost natural occurrence of white pines in the upper Mississippi valley. They are isolated nearly 200 miles south of the natural southern limit of native white pines in central Wisconsin and may represent a remnant of Mankato flora. Other isolated stands of white pine formerly existed in the Rock River country, but have been cut away.

17.2 Galena (Dunleith) dolomite is exposed in the right (north) bank of the road.

18.5 Turn right (north) on black-top road at Gulf Service Station. A small cheese factory lies just east of the station.

19.0 Burlington railroad crossing (Chicago-Minneapolis line) at village of Stratford. North of Stratford the Illinoian till plain, veneered by Peorian loess, is conspicuously flat. Because of poor drainage during the Sangamon interglacial interval the upper 3 to 4 feet of the till here has been altered to gumbotil.

20.0 Turn right (east) continuing on black-top road.

20.5 Turn left (north) continuing on black-top road. Illinoian high-level gravel in road bank at northwest corner of intersection.

21.6 Turn right (east), continuing on black-top road.

21.9 STOP 4 - VICTORY SCHOOL - GALENA GROUP.

Quarry on west bank of Pine Creek, 1100 feet northwest of road NW.$\frac{1}{4}$ SW.$\frac{1}{4}$ SE.$\frac{1}{4}$ Sec. 32, T. 24 N., R. 9 E., Ogle County (Oregon quadrangle).

Discussion Leader: H. B. Willman

See figure 12.

Near the top of the quarry is the contact between the slightly argillaceous cherty dolomite of the Dunleith formation (below)

Mileage

and the pure, porous, more thick-bedded dolomite of the Wise Lake formation (above), a lithologic relationship which has been traced from New York to Colorado and from northern Michigan to Tennessee.

The Dunleith formation in the type area in extreme northwestern Illinois shows a distinct alternation of argillaceous dolomite and relatively pure dolomite. Regional tracing has shown that such units extend much more widely than those based on other lithologic or faunal characteristics. In general, the argillaceous units are more closely related by gradation to the purer dolomite below than to that above. Consequently, the combination of the argillaceous unit with relatively pure beds below forms a natural unit which is considered a member. On this basis the Dunleith formation is differentiated into nine members (fig. 3).

The Dunleith formation increases in purity southward in Illinois and the tops of the members become very weakly developed in the Dixon area. A short distance south of Dixon the lower part of the formation grades to pure Kimmswick-type calcarenite (detrital limestone), in which some of the argillaceous beds disappear. Identification of the Dunleith members in the Dixon-Oregon area is based largely on matching lithologic sequences in numerous exposures between Dixon and the type section at East Dubuque. The fucoidal argillaceous beds in the Wyota member, the bentonite 3 feet above the base of the Wall member, and the abundance of Receptaculites oweni in the basal Sherwood and Rivoli members (Middle Receptaculites zone) are characteristics of those members in the type area.

23.5 Turn left (north), continuing on black-top road.

24.8 STOP SIGN at west edge of Mt. Morris. Straight ahead on black-top.

25.0 STOP SIGN - Junction of county highway with Illinois State Highway 64. Turn right (east) on Ill. 64 through town of Mt. Morris.

Historical Note: Mt. Morris, population 2,709, was established in 1841, and was named for Bishop Morris of the Methodist Episcopal Church. Mt. Morris is the home of the Kable Printing Company, publishers of sports and western magazines and catalogues.

26.2 Railroad crossing.

28.4 to 29.6 Glimpses of the valleys of Silver Creek and Leaf River, tributaries to Rock River from the west, may be seen through trees on the left (north) side of the road. These streams occupy broad preglacial valleys.

30.2 From here to the town of Oregon, the Oregon basin, a physiographic feature coinciding with the axial portion of the Oregon anticline, can be viewed through breaks in the trees on the right (south) side of the road. The basin is about 3 miles wide and 15 miles long and has a maximum relief of 250 feet.

Mileage

The Oregon anticline probably attained its present form in late Pennsylvanian time, although upward movement began at least as early as Middle Ordovician. During the erosion of the Lancaster peneplain, probably completed in Pliocene time, the anticline was truncated and the St. Peter sandstone exposed. In late Pliocene or early Pleistocene time, uplift resulted in removal of the friable sandstone and the creation of the Oregon basin, which drained eastward to the ancient Rock Valley and had a maximum relief of about 350 feet. Subsequently the basin slopes were mantled with Illinoian drift, Rock River was diverted to a position crossing the basin, and the floor of the basin was buried by Wisconsin valley-train and slackwater deposits.

30.5 Highway cuts expose St. Peter sandstone unconformably overlain by the Kingdom sandstone and the Daysville dolomite of the Glenwood subgroup.

31.7 STOP SIGN - Intersection of Illinois State Highways 2 and 64 in Oregon. Continue straight ahead on Ill. 64. The town is on a valley train of Cary (Valparaiso) age.

Historical Note: Oregon, population 3,205, was founded in 1836 by eastern settlers. It is the county seat of Ogle County, named for Captain Joseph Ogle, a Revolutionary officer and early Illinois settler. Local industries include the manufacture of pianos, trucks for oiling roads, silica for pottery glaze, electric power from Rock River, foundry castings, milk products, furnaces, and coal stokers.

32.0 Cross Rock River.

32.2 Turn left (north) onto gravel road at west side of Phillips 66 Service Station.

32.4 Turn left (west). The road is built on a valley train terrace of Mankato age, and follows a route made by bands of horse thieves who harrassed the settlers in the 1840's.

32.5 Turn right (north). Glimpses of the Black Hawk Statue on a high wooded bluff to the north may be seen through the trees.

33.7 Road cut and old quarry on right (east) side of road exposes beds ranging from the Harmony Hill shale (uppermost Glenwood) at the base to the Quimbys Mill dolomite (uppermost Platteville) at the top.

The Mifflin formation is absent here because of contemporaneous uplift on the Oregon anticline. Elsewhere in the area, this uplift is expressed by submarine sliding and folding of Mifflin strata. The beds here strike N. 83° W. and dip 12° NNE. off the north flank of the anticline.

33.9 Turn left (west) into Lowden Memorial State Park.

Mileage

LUNCH STOP (ONE HOUR) AT LOWDEN MEMORIAL STATE PARK.

Park and Statue - The park is the former estate of the late Wallace Heckman, Chicago attorney, and recently was deeded to the State of Illinois. It is named in honor of Frank Lowden, former governor of Illinois, whose estate lies south of Oregon on the east bank of Rock River. The Black Hawk Statue, rising fifty feet from the crest of the bluff on the west side of the park, is the work of Lorado Taft. It commemorates the American Indian as typified by Chief Black Hawk and was built of steel-reinforced concrete in 1910. The island below the bluff was the site of annual religious ceremonies by the Fox and Sauk tribes for many years prior to the Black Hawk War. The stone buildings at the north end of the park were used for many years by Mr. Taft to house a summer school for painters and sculptors. These buildings ("The Artists' Colony") and the stone mansion on the south side of the park now are used by Northern Illinois State College at DeKalb for summer courses.

Geology - The basal members of the Dunleith formation are exposed in the bluff below the statue. The top of the bluff rises 150 feet above Rock River. In establishing its post-Illinoian course Rock River here overtopped a preglacial divide two miles wide, and cut a deep narrow valley called the "Narrows" through Galena and Platteville bedrock. There are good views of the valley from the statue and the Artists' Colony.

Historical Note: In 1832, against the advice of Chief Keokuk, Black Hawk, a subchief of the Sauk, led his tribe from Iowa into the Rock River valley to stop infiltration of the valley by settlers who were violating a treaty guaranteeing the valley to the Sauk. Although accompanied by their women and children, the Sauk were regarded as a war party by the settlers. Most of the settlers fled south to Princeton and LaSalle where the Indians remained quiescent under the leadership of Chief Shabbona, who was friendly to the whites.

Militia and army infantry dispatched to Dixon caught up with Black Hawk's rear guard of forty warriors at Stillman's Run, a tributary to Rock River nine miles northeast of Oregon. The militia were ambushed and routed, with a loss of eleven killed and fourteen wounded, and made a headlong retreat to Dixon, 25 miles away.

Under army pressure, Black Hawk later retreated northward to Rockford and thence westward across southern Wisconsin to the mouth of the Bad Axe River, between La Crosse and Prairie du Chien. Here most of the tribe were massacred by a river gunboat while they were attempting to cross the Mississippi into Iowa. Black Hawk remained a government prisoner until his death in 1849. His last words were: "I loved the Rock River country, its hills, its forests, and its streams. I fought for it but it is now yours. Keep it as well as we did!"

Mileage

34.0 Turn right (south) on county road at entrance to park.

35.3 Turn left (east).

35.4 Continue straight ahead (east) at road intersection.

35.5 Turn right (south) at intersection.

STOP 5 - OREGON - FRANCONIA, TREMPEALEAU, AND ST. PETER STRATA.

Quarry exposure and hill slope outcrops, W.½ SE.¼ NE.¼ Sec. 3 (elongate), T. 23 N., R. 10 E., Ogle County (Oregon quadrangle).

Discussion Leader: J. S. Templeton

See figure 13.

Stratigraphy. A long-abandoned quarry on the right (east) side of the farm lane affords the only known exposure of the Franconia formation in Illinois. This formation is the oldest which outcrops in the state. The Franconia consists of argillaceous silty glauconitic sandstone which is greenish gray, fine-grained, friable, and thin-bedded, and contains abundant accessory garnets. Some beds of impure buff dolomite also are present. The fauna, identified by G. O. Raasch, consists of Dikellocephalus freeburgensis Feniak, Illaenurus truncatus Feniak, and Saukiella minor Ulrich and Resser, fragmented oboloid brachiopods and abundant worm castings. It is of Bad Axe (uppermost Franconia) age. The outcropping thickness is 30 feet, largely because of northeastward dip, but only a fraction of this thickness is well exposed.

Trempealeau dolomite, mostly mantled by slumped loess, crops out in the east quarry face, where it is 23 feet thick. The dolomite is silty, sandy, slightly glauconitic, pink to buff, finely crystalline and massive. Small algal reef cores of the Cryptozoon type are present, but no other Trempealeau fossils have been found at this exposure. The uppermost part, about 4 feet thick, has been leached to a siltstone by pre-St. Peter weathering.

The Trempealeau is separated from the overlying St. Peter sandstone by a major unconformity along which Lower Ordovician formations (Gunter dolomite and sandstone, Oneota dolomite, New Richmond sandstone, and Shakopee dolomite, in ascending order) have been removed by pre-St. Peter erosion in much of northern Illinois. Along the road south of the quarry, St. Peter ledges abut against Trempealeau dolomite, and on the hill slope south of the road the St. Peter extends down to the valley floor. The sandstone is believed to have been deposited in a pre-St. Peter channel.

Structure. The Cambrian strata in the quarry dip from 7° to 13° NE. Beneath the town of Oregon pre-St. Peter faulting has dropped

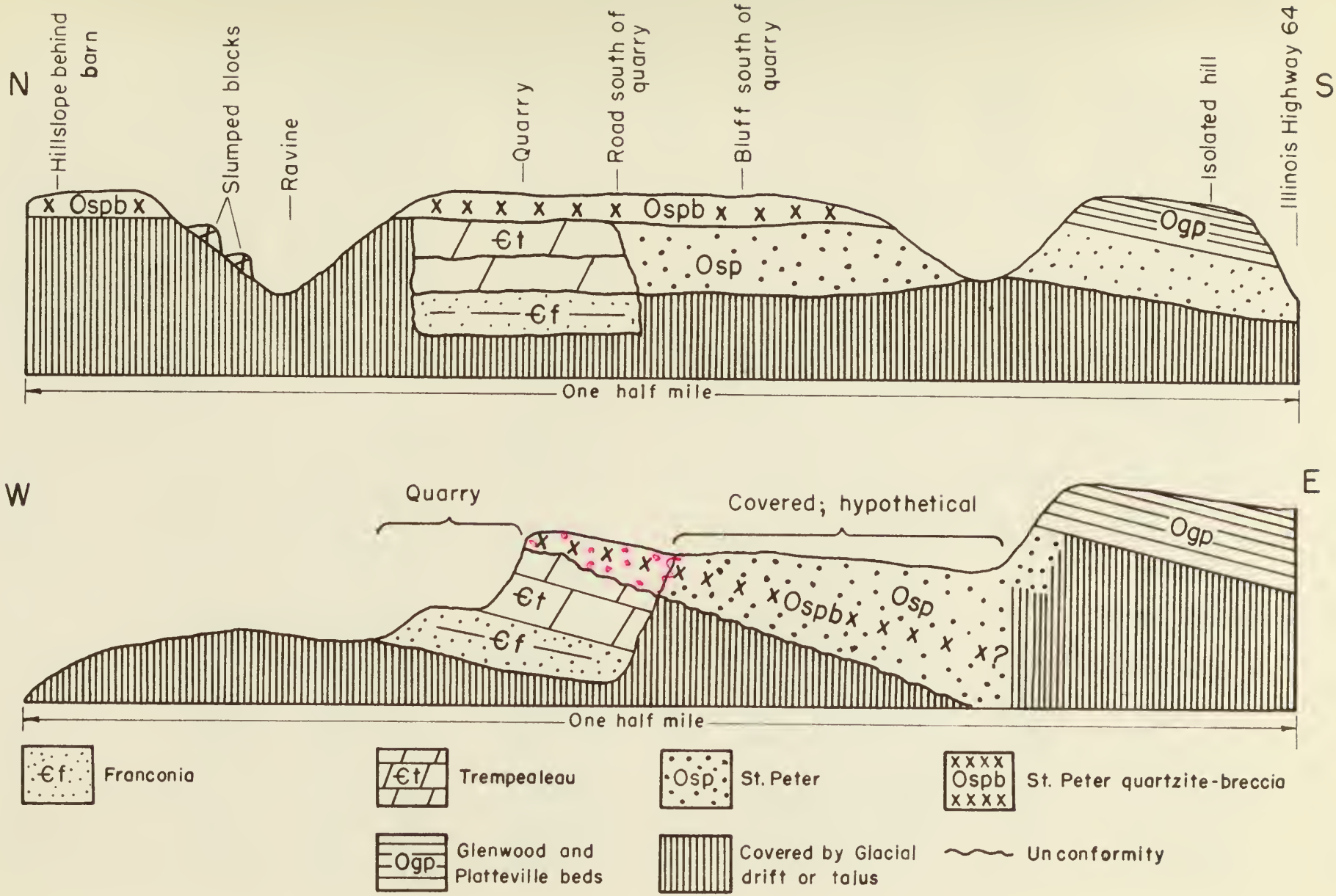


FIG. 13—DIAGRAMMATIC CROSS SECTIONS THROUGH CAMBRIAN EXPOSURE AT STOP 5

Mileage

the Franconia-Trempealeau contact at least 235 feet and probably 400 feet lower. The St. Peter just above the Trempealeau has been altered to a quartzite breccia which crops out in the hill slope northeast of the barn. The distribution of the breccia suggests that it lies along a thrust fault which dips gently eastward and cuts through the lower part of the St. Peter sandstone. The breccia zone lies above the St. Peter outcrop south of the quarry.

Origin. The Cambrian exposure here, discovered by Dr. A. C. Bevan in 1923, is attributed to three factors: (1) location on the upthrow side of a large pre-St. Peter fault, (2) location on the Oregon anticline, (3) deep erosion by Rock River.

Correlation. Subsurface tracing has suggested that the Franconia formation is equivalent to the Davis formation of Missouri and that the Trempealeau dolomite in Illinois corresponds to the Derby-Doe Run, Potosi, and Eminence formations of Missouri, listed in ascending order. Although the Trempealeau formation in Wisconsin consists of dolomite, siltstone, and sandstone, the clastics grade southward into dolomite more than 200 feet thick in Illinois. The exposure here is believed to be equivalent to the basal Arcadia member of the Trempealeau formation in Wisconsin, described by G. O. Raasch in 1951, and to the Derby-Doe Run sequence in Missouri.

35.8 STOP SIGN - Junction with Illinois State Highway 64. Turn left (east) on Ill. 64.

36.1 Pecatonica, Glenwood, and St. Peter strata are exposed in the small isolated hill and cut bank on the left (north) side of the highway. The beds lie on the northern flank of the Oregon anticline, strike N. 50° W. and dip 11° N. E. The normal N. 70° W. strike of the anticline here is deflected by a nearby northeastward-trending anticlinal cross fold.

36.3 The large quarry ¼ mile north of the highway is locally operated for road metal, agricultural limestone, concrete aggregate, and riprap for the Oregon dam. The face, about 40 feet high, exposes a sequence ranging from the upper part of the Grand Detour formation to the lower part of the Dunleith formation. The entire Platteville-Galena sequence consists of dolomite in this area. The scarp in which the quarry has been opened is the north rim of the Oregon basin.

36.7 St. Peter sandstone, showing prominent cross-bedding and dipping gently north-northeastward, crops out in the east bank of the stream on the left (north) side of the highway. Small St. Peter exposures occur at intervals along the highway for the next 2 miles.

38.4 Turn right (south) on gravel road.

38.6 STOP 6 - ILLINOIAN DRIFT

Road cuts, SE.¼ SE.¼ SE.¼ Sec. 1 (elongate), T. 23 N., R. 10 E., Ogle County (Oregon quadrangle).

Mileage

Discussion Leader: M. M. Leighton

Illinoian till overlain by Illinoian ice-contact gravels are exposed in cuts on both sides of the road. The gravels are believed to have been deposited in lakes or streams between preglacial valley slopes and masses of stagnant wasting ice in the central, inner portion of the valley. Road cuts down the hill to the south show that the gravel mantles the surface of the till and probably represents successive deposits along the margin of the ice as it melted away from the valley wall. Ice-contact gravel containing large boulders is exposed on the right (west) side of the road at the base of the cut. Sangamon weathering has oxidized the upper part of the gravel to a dark red-brown, has made it moderately clayey, and has leached it of carbonates to a depth of 7 feet. The total depth of leaching in Illinoian gravels normally is more than 10 feet, but here the top of the deposit has been lowered by recent sheet wash.

The Oregon basin is visible to the south.

39.1 The low hills west of the road represent the ice-contact face of the Illinoian high-level gravel deposit seen at the last stop. The strongly lobate face is characteristic and well developed.

St. Peter sandstone crops out in the low stream bank to the left (east).

39.3 Cross Honey Creek. The low terrace on the south side of the creek consists of outwash from the Green River lobe of Shelbyville (Wisconsin) age (See fig. 7). The outwash forms a valley train along Kyte River (to the south) and along the lower part of its tributaries.

39.7 CAUTION: Burlington railroad track (route of the Chicago-Minneapolis Zephyrs) at the hamlet of Honey Creek.

Turn right (west) just south of tracks.

40.2 Turn right (north), dropping down to Recent flood plain of Honey Creek.

40.5 Recross Burlington railroad track.

40.7 Hill composed of Illinoian high-level gravel rises on the right (east).

40.8 Illinoian gravels are exposed in the east bank of the stream on the left (south) side of the road. St. Peter sandstone crops out in the west bank. The gravels are at a lower elevation, have a well-defined but dissected terrace surface, and are better sorted and stratified than the higher deposits. They probably are later Illinoian gravels derived from the stream erosion of high-level deposits, and laid down on a valley flat or in a temporary lake marginal to the ice. A terrace of Wisconsin outwash, about 20 feet lower, is well developed at the mouth of the valley.

41.1 Winding road crosses ridge composed of Illinoian ice-contact gravels.

Mileage

41.3 Hill to left (south), St. Peter sandstone surrounded by ice-contact gravels which are banked against the lower slopes of the bedrock hill.

41.4 Turn right (north).

42.2 STOP SIGN t intersection with Illinois State Highway 64. Turn left (west) on Ill. 64.

43.5 Cross Rock River and enter Oregon.

43.8 STOP SIGN at intersection of Illinois State Highways 2 and 64 in Oregon. Turn right (north) on Ill. 2, which here is built on a valley-train terrace of Cary (Valparaiso) age.

44.5 Highway descends to the Mankato terrace.

44.9 View of Black Hawk Statue across river to right (east).

46.6 Grand Detour dolomite in cut on left (west) side of road is broken into a series of miniature horsts and grabens by small faults striking northwestward. The dolomite adjacent to some of the faults shows drag-flowage.

46.7 Cross Mud Creek.

46.8 Turn left (west) on gravel road.

47.1 Turn left (west) on gravel road.

48.8 STOP 7 - MUD CREEK FAULT - PLATTEVILLE AND GALENA STRATA.

Park and walk 0.3 mile south.

Quarry on south side of Mud Creek and east side of abandoned road, NW.$\frac{1}{4}$ SW.$\frac{1}{4}$ SE.$\frac{1}{4}$ Sec. 30, T. 24 N., R. 10 E., Ogle County (Oregon quadrangle).

Discussion Leader: J. S. Templeton.

See figure 14.

The quarry cuts across a monocline which dips very steeply northward and across a westward-striking fault with the downthrow on the north side. At the top of the valley slope, just south of the quarry, are a few small outcrops of Nachusa dolomite. Steeply dipping Quimbys Mill, Buckhorn, and St. James strata are exposed in the south and southwest faces; at the top of the southwest corner of the quarry they are nearly vertical. The Guttenberg formation is missing. At the bottom of the southwest corner Quimbys Mill beds are cut by open, horizontal tension cracks. Bedding surfaces in this sequence are polished and grooved by bedding-plane faulting. Some of the strata are brecciated. Green clay between the bedding surfaces in some places may represent fault gouge, but more probably is a solution product.

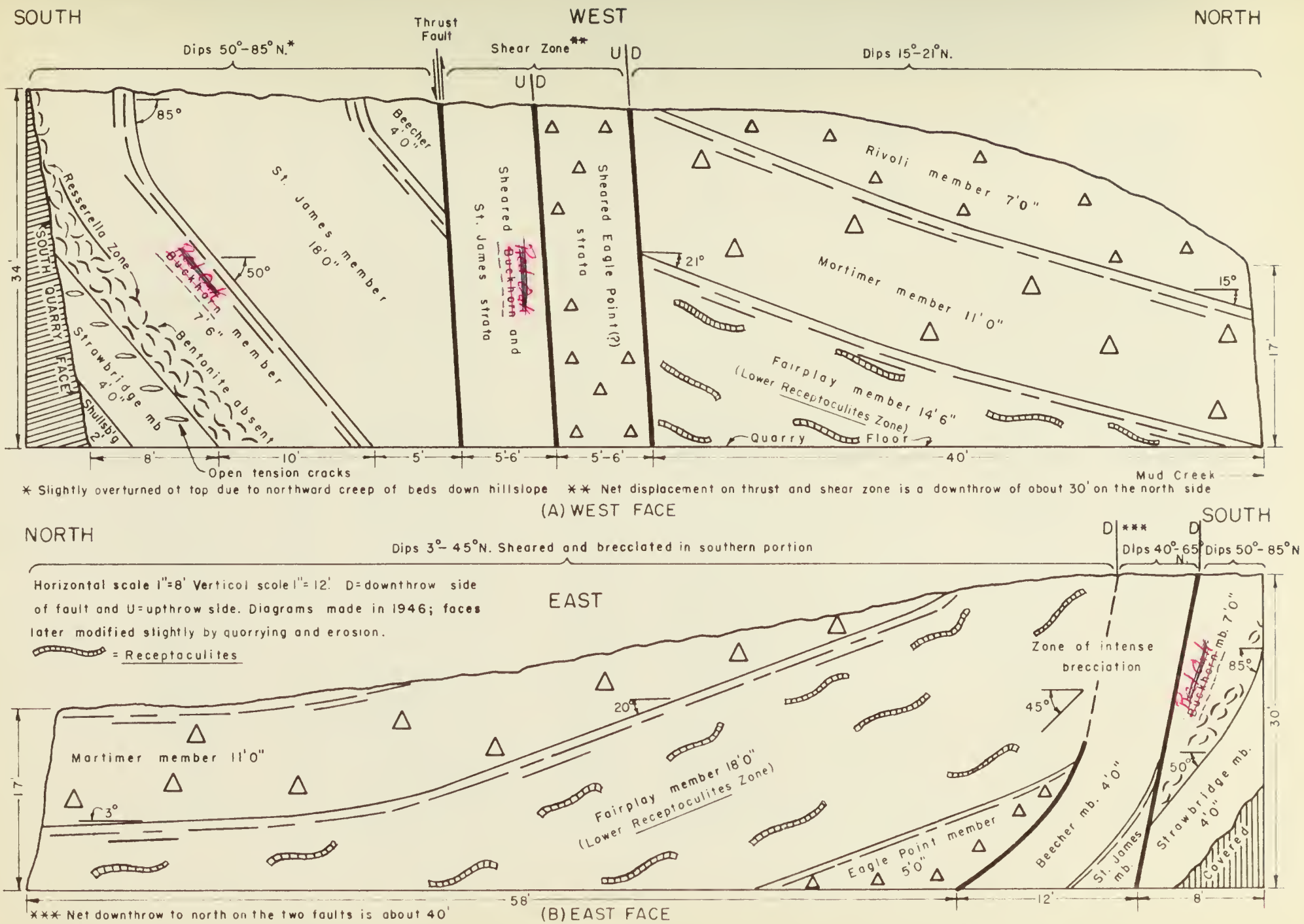


FIG. 14- STRUCTURE IN WEST AND EAST QUARRY FACES AT STOP 7 (MUD CREEK FAULT)

Mileage

A fault extending from the southeast corner of the quarry to the middle of the west face has finely brecciated beds belonging to the Beecher, Eagle Point, Fairplay, and Mortimer members of the Dunleith formation and in the west face has brought Fairplay opposite St. James strata (see Columnar Section, fig. 3). Some of the brecciated chert and dolomite has been recemented.

The total downward displacement on the north side of the fold and fault is 100 feet within a horizontal distance of 200 feet. This structure lies on the north flank of the Oregon anticline and indicates that some of the uplift was due to faulting.

50.3 Turn left (south) on gravel road.

50.8 STOP SIGN - Junction with Illinois State Highway 64. Turn left (east) on Ill. 64.

51.2 Turn right (south) on gravel road.

52.2 Intersection with township road. Continue straight ahead.

Between this intersection and the Burlington railroad crossing, 0.4 mile farther south, shallow cuts on the east side of the road expose Illinoian till approaching gumbotil, overlain by Peorian loess. Farmdale loess has not been found in this area. Illinoian gumbotil veneered by Peorian loess underlies the flat upland north and west.

52.6 CAUTION: Burlington railroad crossing. Cut on northeast corner of crossing exposes Illinoian high-level terrace gravels banked against the north slope of the preglacial bedrock valley of Gale Creek.

52.7 Cross Gale Creek.

52.8 Illinoian ice-contact terrace gravels are extensively banked against the south valley slope of Gale Creek for more than 3 miles. The northern or ice-contact face of the terraces has a lobate form which is well shown on the Oregon topographic sheet. Numerous abandoned and active gravel pits, some having vertical faces 40 feet high, are located in these terraces. The gravel is poorly sorted and bouldery and shows rapid lateral variation.

53.0 Illinoian high-level gravels capped by Peorian loess are exposed in the cut bank on the left (east) side of the road.

54.5 STOP SIGN - Turn left (east) on county black-top road.

Between this intersection and Stop 8 the hills along the road consist mainly of Illinoian high-level terrace gravels on the valley slopes of preglacial Gale Creek and its tributaries.

55.3 Good view of Oregon basin straight ahead.

Mileage

55.5 Turn right (south) on gravel road.

55.7 Turn left (east) into pasture.

STOP 8 - SANDWICH FAULT ZONE AND PLATTEVILLE-GALENA STRATIGRAPHY.

Chicago, Burlington and Quincy railroad cut, NW.¼ NW.¼ SE.¼ and NE.¼ SW.¼ Sec. 7, T. 23 N., R. 10 E., Ogle County (~~Oregon~~ Dixon quadrangle).

Discussion Leaders: H. B. Willman and J. S. Templeton.

See figure 15 (3 pages).

The major fault in the Sandwich fault zone is believed to lie 0.4 mile southwest of the bridge over the railroad tracks. Throughout its course the Sandwich fault zone lies just north of and parallel to the axis of the Ashton Arch (fig. 6) and in this vicinity has a downthrow of about 300 feet on its northern side. The faulting exposed here in the railroad cut lies parallel to the major fault and to the south limb of the Oregon anticline. It has a total downthrow on its southern side of 270 feet, and cuts beds ranging from Pecatonica to Wise Lake in age. Consequently the Oregon anticline here is separated from the Ashton Arch by a deep narrow graben.

There are at least twenty closely spaced individual faults, mostly marked by breccia zones, in the cut. The largest, near the west end of the cut, brings Quimbys Mill dolomite next to Wise Lake dolomite and has a downthrow on the south side of at least 130 feet. This faulting may continue northwestward and account for the sharp downward displacement on the southwestern side of the Oregon anticline at Mt. Morris (fig. 6).

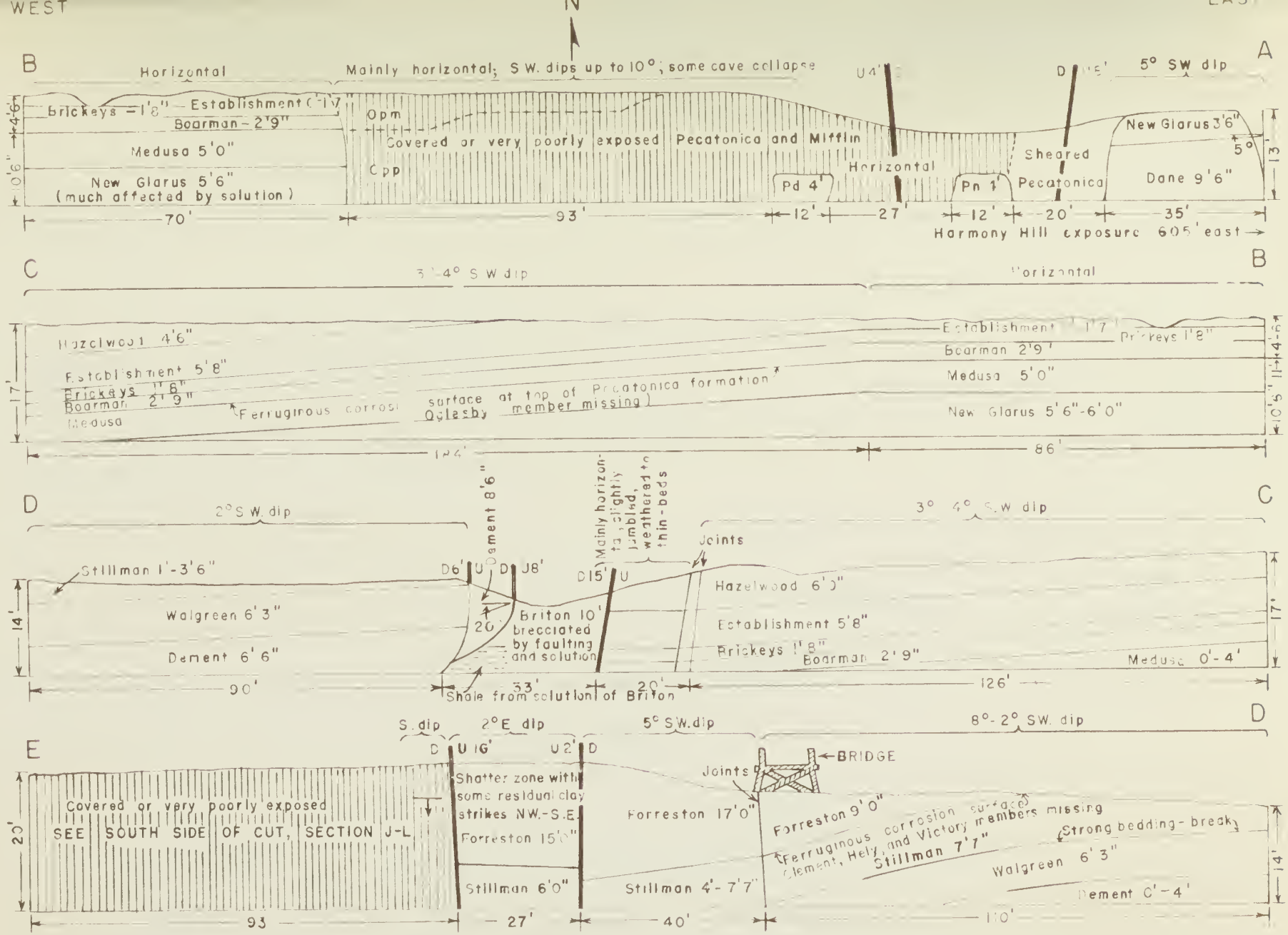
55.9 Turn right (north) on gravel road and retrace route to county black-top highway.

56.1 STOP SIGN - Turn right (east) on county black-top road.

From this point east to Gale Creek, Illinoian high-level gravels form prominent hills on the right (south) side of the road.

57.1 Cross Gale Creek. One-half mile south is the plant and former pit of the National Silica Company. The chief product is very finely ground silica derived from the St. Peter sandstone and used as pottery glaze. Much of the product in recent years has been shipped to the Kresge Pottery Works at Holland, Michigan, for use in the production of china sold in Kresge stores.

The original pit has been abandoned because of the high iron-oxide content and high degree of cementation of the sand. Sand is now obtained from a pit in St. Peter bluffs along Rock River, two miles southeast.



CROSS SECTION OF FAULT ZONE IN BURLINGTON RAILROAD CUT AT STOP 8

Opm = Mifflin fm; Opp = Pecatonica fm; Pn = New Glarus mb; Pd = Dane mb; D = downthrow side of fault and U = upthrow side, with displacement in feet

Vertical Scale One inch = twenty feet

Horizontal Scale: One inch = thirty feet

Fig. 15 A – EAST HALF, LOOKING NORTH (See Fig. 15C for Plan View)

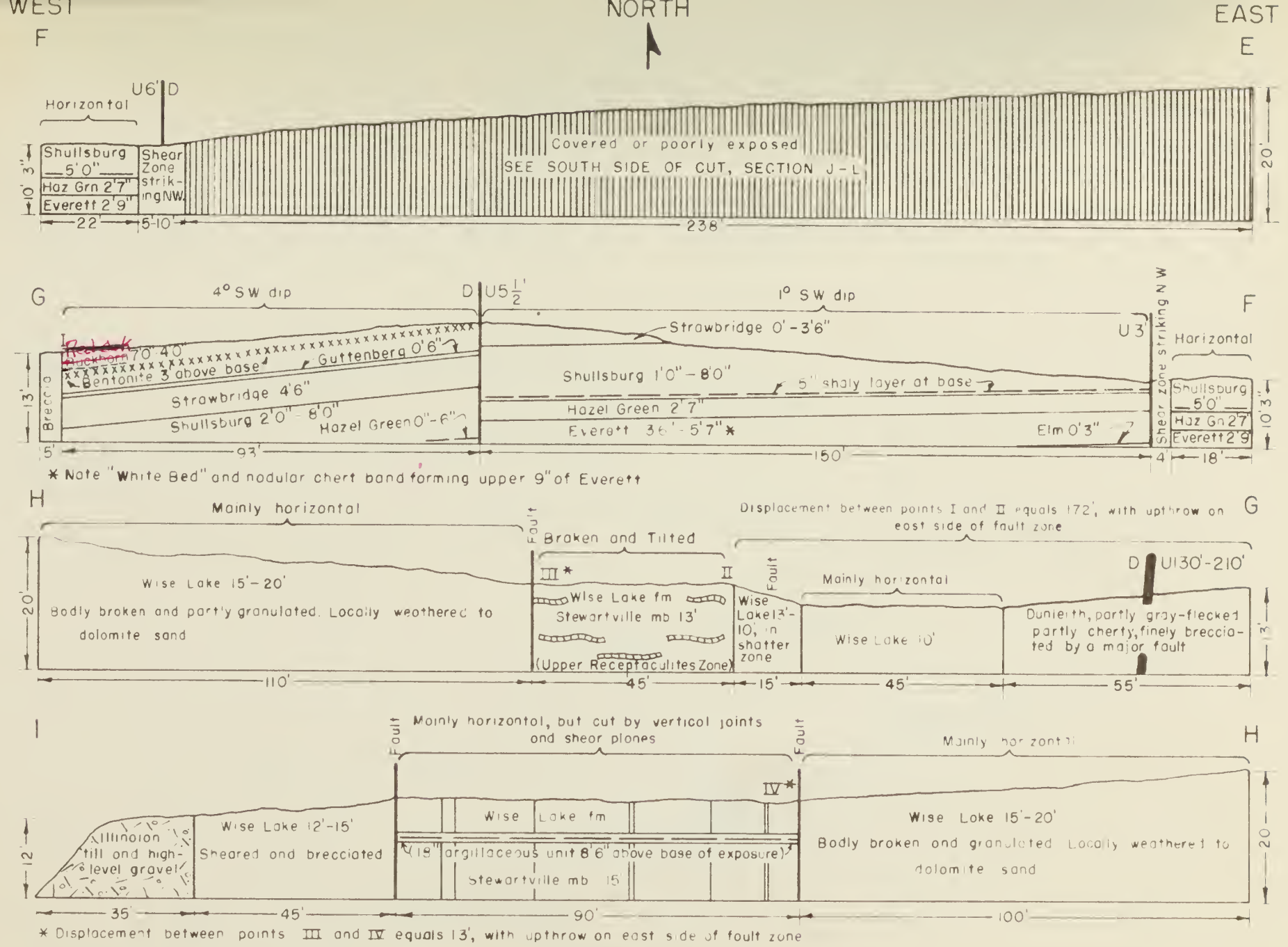
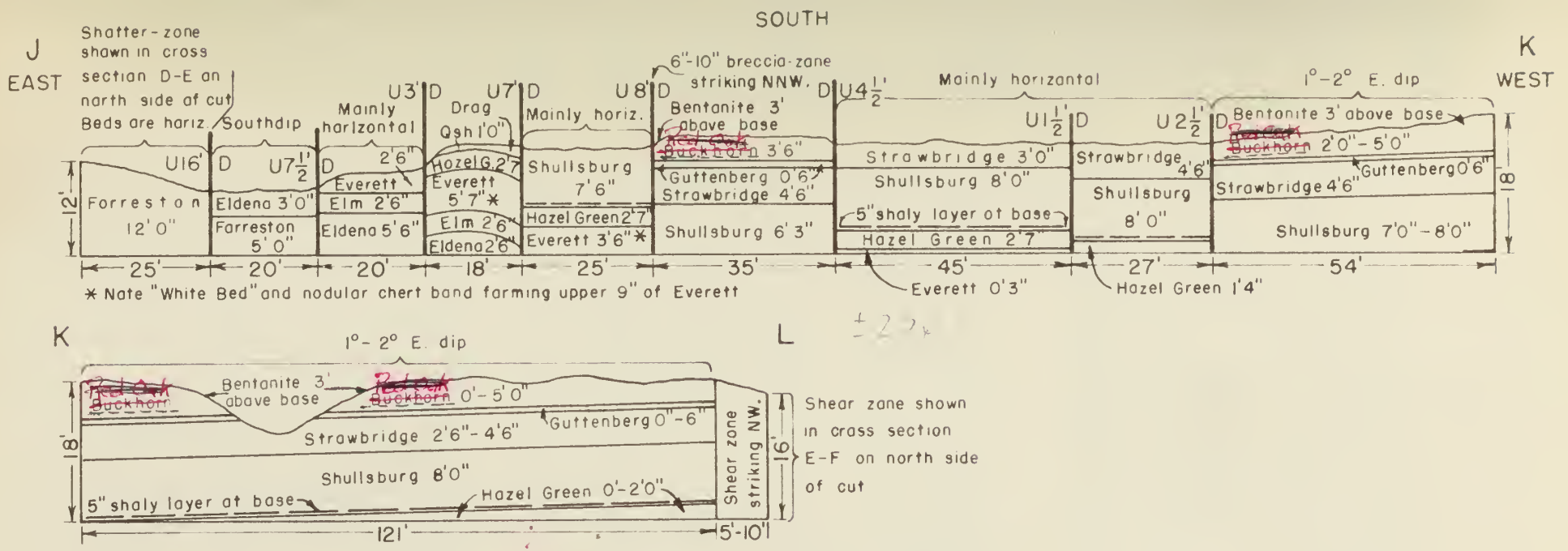


FIG. 15 B - WEST HALF, LOOKING NORTH

Haz Grn. = Hazel Green mb D = downthrow side of fault and U = upthrow side, with displacement in feet

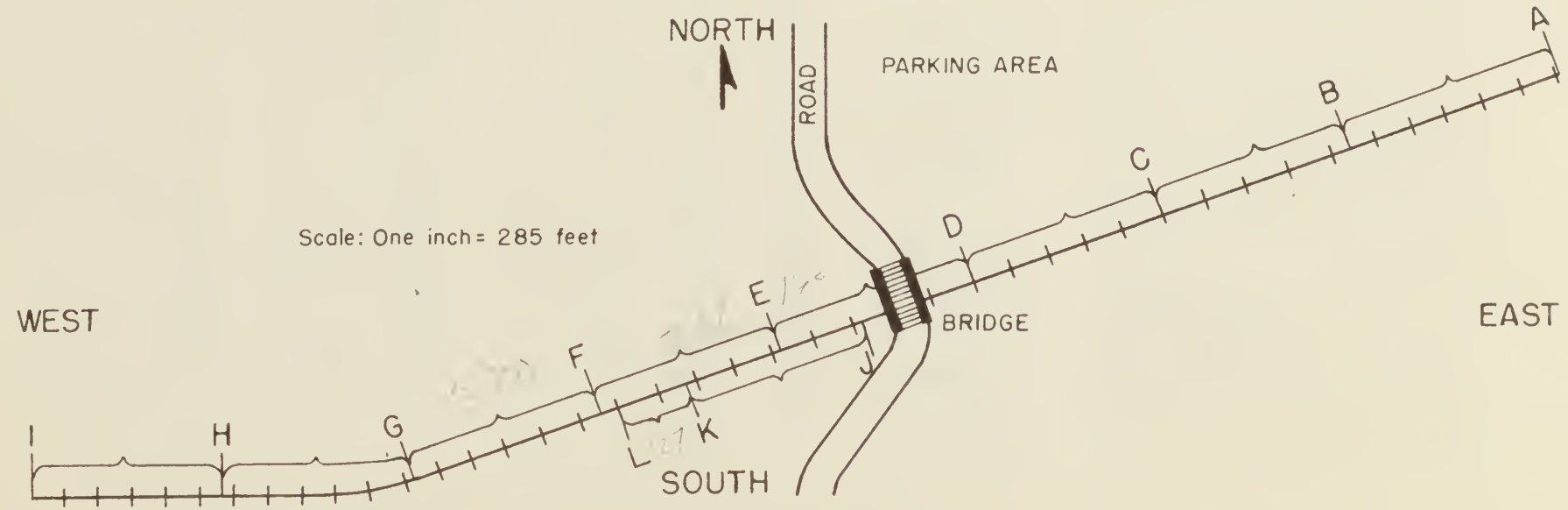
Vertical Scale: One inch = twenty feet Horizontal Scale: One inch = thirty feet

35B



LOOKING SOUTH, WEST OF BRIDGE

D = downthrow side of fault and U = upthrow side, with displacement in feet. Vertical Scale: One inch = twenty feet. Horizontal Scale: One inch = thirty feet



LOCATION OF CROSS SECTIONS IN BURLINGTON RAILROAD CUT AT STOP 8

FIG. 15C

35C

Mileage

The sand is thoroughly washed to remove the very little clay and iron oxide content (generally less than 2 percent) and is ground to pass 325-mesh screens. The grinding is in ball mills which are lined with pre-Cambrian quartzite blocks from quarries at Rib Hill, near Wausau, Wisconsin, and which are partly filled with chert nodules from the Cretaceous chalk of Belgium. The nodules are found in large quantities on North Sea beaches and commonly are brought to this country as ship ballast. After grinding, the sand is passed under a magnet to remove iron or steel particles which would burn to objectionable black flecks when the pottery is fired. During World War II the supply of Belgian chert nodules was cut off and quartzite blocks from Wausau and granite blocks from North Carolina were temporarily substitued. The quartzite blocks proved too brittle. The granite blocks were too soft and introduced too much feldspar and ferromagnesian material into the sand.

57.2 CAUTION: Cross Burlington railroad. For the next 1.3 miles the road is on Cary (Valparaiso) slackwater silt and clay. These sediments accumulated in ponded water in Gale Creek valley, which was dammed by the Valparaiso valley train in Rock River valley. The slackwater material forms the floor of the Oregon basin and is partly underlain by Oneota and Trempealeau dolomite.

58.5 A slight eastward rise in the valley floor marks the boundary between Valparaiso slackwater silt to the west and the Valparaiso valley train (gravel and sand) to the east.

58.7 STOP SIGN - Junction of county black-top road with Illinois State Highway 2 at the south edge of Oregon. Turn right (south) on Ill. 2.

58.9 Cross Burlington railroad (Chicago-Minneapolis line) on overhead viaduct. There is a good view of the Oregon basin on each side.

60.2 A pit in the sand and gravel of the Mankato valley train is on the left (east).

60.3 On the right (west) is the Devil's Backbone, a prominent westward-trending ridge of St. Peter sandstone capped by Glenwood strata and Pecatonica dolomite. This ridge forms the south wall of the Oregon basin west of Rock River. Its summit has an elevation of 905 feet, represents a remnant of the Lancaster peneplain, and is the highest point in the Dixon quadrangle. Although cross beds in the St. Peter sandstone dip north, the actual dip of the strata is south.

60.5 National Silica Company Pit on right (west) in St. Peter sandstone. Sand is trucked from here to the plant, two miles northwestward.

61.6 Oneota dolomite crops out in cut bank on right (west).

61.7 Drive slowly for car-window geology.

Mileage

A large fault is marked by a broad breccia zone in the road cut on the right (west). This fault (look for sign) lies within the graben between the Ashton arch and the Oregon anticline and is part of the Sandwich fault zone. The fault brings New Richmond sandstone and Shakopee dolomite on the south against the older Oneota dolomite on the north. The breccia zone is mainly in the Oneota formation. Cross faulting has exposed a few blocks believed to be Trempealeau dolomite near the base of the cut, south of the main fault. St. Peter sandstone with a basal chert conglomerate rests unconformably on beds ranging from Shakopee to Oneota in age and cuts down to road level at the south end of the exposure.

62.5 Straight ahead is Castle Rock, a prominent erosion remnant of St. Peter sandstone and a well-known landmark. A fine view of Rock River is available from the top of the rock.

63.4 St. Peter sandstone is well exposed in two deep, steep-walled cuts along the highway.

From this point southward to Grand Detour the highway mainly is on Wisconsin valley-train terraces.

68.2 Village of Grand Detour.

68.9 Cross Rock River. For the next half mile, there are several exposures of St. Peter sandstone in cuts along the highway.

69.9 Small exposure in cut on right (west) side of highway shows St. Peter sandstone overlain by the Kingdom sandstone and Daysville dolomite of the Glenwood subgroup. The relatively resistant Daysville dolomite forms a bench in the middle of the hill slope.

70.0 Pecatonica dolomite capping the weaker Harmony Hill shale and Loughridge sandstone forms a second bench at the top of the hill, although the formations are concealed by slumped Peorian loess and by a heavy cover of grass.

71.4 Small sink-holes are present in the Mifflin limestone on both sides of the highway. The cover of Illinoian till and Peorian loess is very thin and patchy on this portion of the upland surface.

72.4 Dixon city limits. Mifflin limestone crops out in low cuts along the highway. Medusa Portland Cement Plant is on the right (north).

73.5 Turn left (south) at Standard Service Station, continuing on Illinois State Highway 2. Nachusa dolomite and limestone is exposed in cliff at left. Nachusa type locality is in abandoned quarry on left (east) side of road, just south of the turn.

74.2 STOP LIGHT - Intersection of Illinois State Highway 2 with State Highway 26 and with U. S. Highways Alt. 30 and 52 at northwest corner of Court House square.

Mileage

NOTICES: Parking meters in Dixon operate until 9 P. M. on Saturday nights. Cars should be serviced tonight, if needed, because few filling stations will be open early Sunday morning.

The annual dinner will be held this evening at 7 P. M. at the Loveland Community House (see map of Dixon, fig. 2).

Restaurants will be open at 6:30 Sunday morning. Cars should leave Dixon not later than 8:00 A. M. in order to arrive at Stop 9, 19 miles northeastward, by 8:30 A. M.

END OF FIRST DAY'S TRIP

Mileage

ITINERARY FOR SUNDAY, OCTOBER 12 (SECOND DAY)
(Columbus Day)

The conference will assemble at Stop 9, 19 miles northeast of Dixon at 8:30 A. M. The log from the Nachusa Hotel in Dixon to Stop 9 is given below.

Those staying at White Pines State Park, at Oregon, or at Grand Detour will find the shortest route to Stop 9 via Oregon as follows:

LOG STARTING AT OREGON

0.0	Intersection of Illinois State Highways 2 and 64 in Oregon. Drive east on Ill. 64.
0.3	Cross Rock River
0.8	Turn right (south) on county black-top road, leaving Ill. 64.
1.1	CAUTION: Cross Burlington railroad tracks (Chicago-Minneapolis line).
2.3	Cross Kyte River.
2.6	Enter village of Daysville.
2.75	Angle left (southeast) on village street.
2.95	Angle left (east) on county gravel road.
4.0	Turn right (south) on gravel road in hamlet of Watertown. House on southwest corner is enclosed by a stone fence built of glacial erratics.
5.0	Turn left (east).
5.1	Continue straight ahead (east) at school house.
6.8	Turn south (right).
7.4	Jog left (east).
7.6	Turn left (east).
7.7	Turn right (south).
7.9	Turn right (west) into farm lane at mailbox marked "H. J. Campbell."
8.5	Park in barnyard north of house. STOP 9.

Mileage

LOG STARTING AT DIXON

0.0 Drive south on U. S. Highways Alt. 30 and 52 and Illinois State Highway 26 on west side of Court House square. Nachusa Hotel on right, Lee County Court House on left.

0.3 STOP SIGN - Junction of U. S. Alt. 30 and 52 with Ill. 26. Turn left (east) on U. S. Highways Alt. 30 and 52.

0.6 Junction of U. S. Alt. 30 and 52. Turn left (east) on U. S. Highway Alt. 30.

5.0 Nachusa Lutheran Home for boys on right (south).

8.9 Cross Franklin Creek. Shakopee dolomite is exposed in abandoned quarry on east bank of creek, about 500 feet north of highway.

The dolomite is argillaceous, silty, sandy, locally glauconitic, buff, chalky, dense, and thin- to medium-bedded. It contains some layers of intraformational conglomerate, nodules of oolitic chert, and small algal domes. Many bedding surfaces exhibit ripple marks, mud cracks, and the rare cubic impressions of salt crystals. Layers of dolomitic sandstone and green or maroon shale are common. Rapid lateral and vertical lithologic change is characteristic.

The ledges between the creek and the quarry floor carry Lingulepsis acuminata (Conrad) and Orospira elevata Cullison. They are similar in lithology, fauna, and stratigraphic position above the New Richmond (Roubidoux) sandstone to the Rich Fountain formation of the Jeferson City group in Missouri, described by J. S. Cullison in 1944.

9.6 Enter Franklin Grove, population 741. Turn left (north) on county black-top road at Shell Service Station.

15.1 Turn right (east) on gravel road.

16.1 Turn left (north).

16.3 Turn right (east). Oneota dolomite is poorly exposed in shallow ditch on right side of curve.

17.0 Trempealeau dolomite is exposed in low cut bank on left (north) side of road.

17.7 Junction with gravel road leading south. Washington Grove Cemetery on left, church on right. Continue straight ahead (east).

17.8 Turn left (north) on gravel road at foot of hill, and cross creek.

18.6 Turn left (west) into private lane at mailbox marked "H. J. Campbell."

19.1 Cross creek and park in barnyard on north side of house.

Mileage

STOP 9 - QUARRIES IN ONEOTA AND PLATTEVILLE STRATA; SANDWICH FAULT.

Quarry in Oneota dolomite, N. line NE.$\frac{1}{4}$ SW.$\frac{1}{4}$ NE.$\frac{1}{4}$ Sec. 31, T. 23 N., R. 11 E., Ogle County (Dixon quadrangle).

Quarry in Platteville dolomite in NE.$\frac{1}{4}$ NW.$\frac{1}{4}$ NE.$\frac{1}{4}$ of same section, 800 feet north of Oneota quarry.

Discussion Leaders: H. B. Willman and J. S. Templeton.

See figure 16.

Twelve feet of deeply weathered Oneota dolomite is exposed in the small quarry on the south bank of the creek, just west of the barn. Other outcrops occur in the creek bank and in tributary ravines farther west. The dolomite is buff, coarsely crystalline, porous, and thin-bedded, and contains thick bands of white oolitic chert. Although the beds are jointed, they are essentially level.

In the quarry 800 feet northward lower Platteville strata strike N. 85° W. and dip up to 10° N. Although the base of the Platteville exposure has nearly the same elevation as the top of the Oneota exposure to the south, the normal stratigraphic interval between the two points is estimated to be approximately 350 feet.

The Sandwich fault, with the downthrow on the north side, is believed to pass between the two quarries. The northward dip of the Platteville strata reflects updrag adjacent to the fault. An alternate but less likely hypothesis is that the Ashton arch was folded and truncated to about the level of the Oneota exposure in pre-St. Peter time, that the St. Peter-Platteville sequence was deposited directly on the Oneota and that renewed uplift along the Ashton arch imparted a northward dip to the Platteville strata.

The Establishment-Bearman sequence is poorly exposed. The corrosion (solution) surface at top of Pecatonica formation has been traced from Minneapolis, Minnesota, to LaSalle, Illinois, although it is missing in a few places, as at Dixon North (Stop 2). In southern Illinois and eastern Missouri it is replaced by an undulatory scour surface.

The distinction between the New Glarus and Dane members of the Pecatonica formation is weak here because the Dane strata are abnormally pure.

Turn around and return east to lane entrance.

19.6 Turn right (south) on gravel road.

20.4 Turn right (west).

20.6 Washington Grove Cemetery on right, church on left. Turn left (south) on gravel road just beyond church.

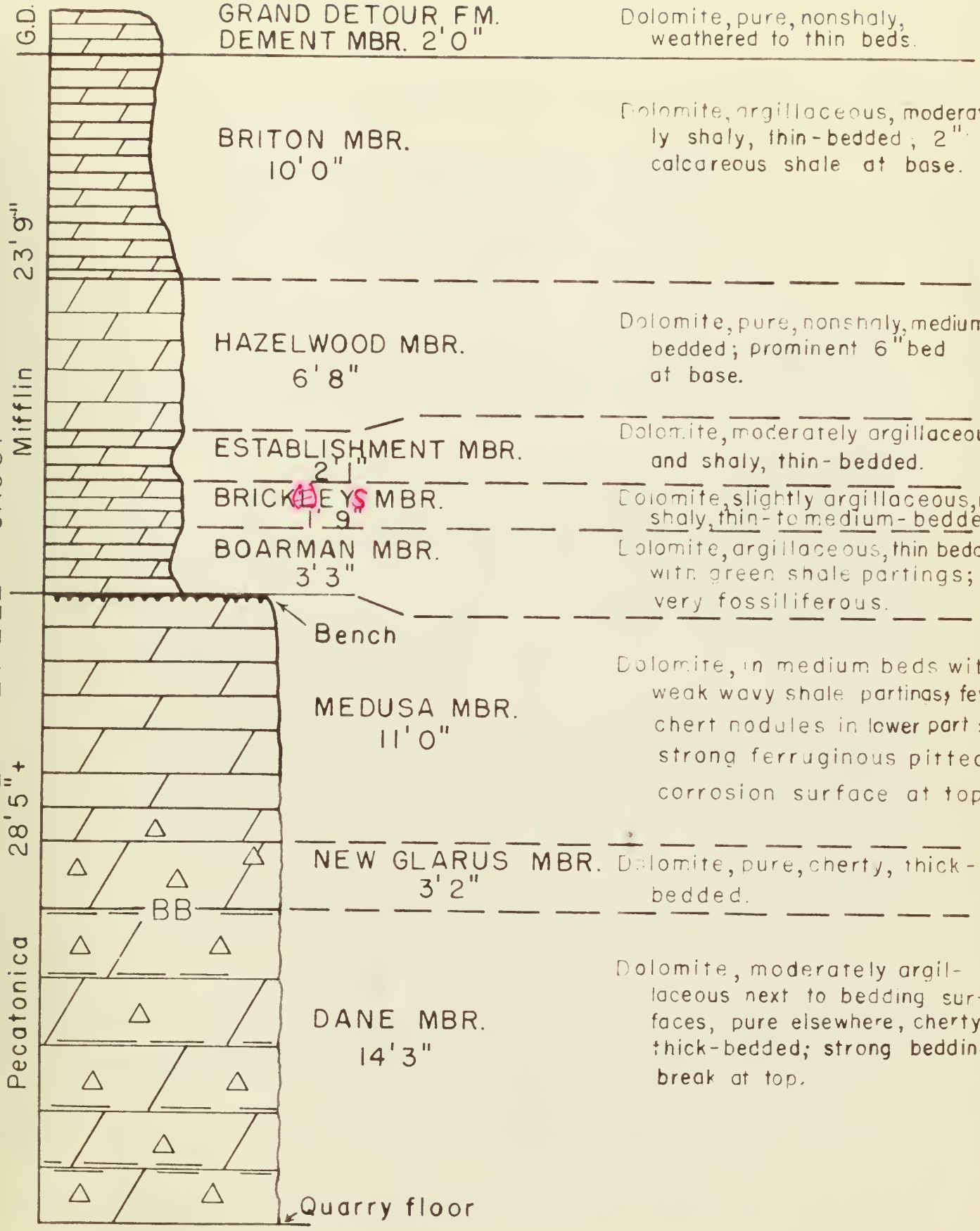

G.D.
GRAND DETOUR FM.
DEMENT MBR. 2'0"
Dolomite, pure, nonshaly, weathered to thin beds.
BRITON MBR.
10'0"
Dolomite, argillaceous, moderately shaly, thin-bedded, 2" calcareous shale at base.
23'9"
PLATTEVILLE GROUP
Mifflin
HAZELWOOD MBR.
6'8"
Dolomite, pure, nonshaly, medium-bedded; prominent 6" bed at base.
ESTABLISHMENT MBR.
2'1"
Dolomite, moderately argillaceous and shaly, thin-bedded.
BRICKEYS MBR.
1'9"
Dolomite, slightly argillaceous, nonshaly, thin- to medium-bedded.
BOARMAN MBR.
3'3"
Dolomite, argillaceous, thin bedded, with green shale partings; very fossiliferous.
Bench
MEDUSA MBR.
11'0"
Dolomite, in medium beds with weak wavy shale partings; few chert nodules in lower part; strong ferruginous pitted corrosion surface at top.
28'5"+
NEW GLARUS MBR.
3'2"
Dolomite, pure, cherty, thick-bedded.
BB
Pecatonica
DANE MBR.
14'3"
Dolomite, moderately argillaceous next to bedding surfaces, pure elsewhere, cherty, thick-bedded; strong bedding-break at top.
Quarry floor

FIG. 16 - STOP 9

Mileage

21.1 Operating quarry in Trempealeau dolomite on the left (east) -- see below.

21.5 STOP 10 - PRAIRIE STAR - TREMPEALEAU (POTOSI) DOLOMITE.

Quarry just northeast of Prairie Star School, SW.$\frac{1}{4}$ SE.$\frac{1}{4}$ Sec. 5, T. 22 N., R. 11 E., Ogle County (Dixon quadrangle).

Discussion Leader: J. S. Templeton

The quarry exposes 18 feet of dolomite which is pure, buff, finely crystalline, vuggy, and thick-bedded to massive. The vugs are lined with white to pink quartz crystals, a characteristic feature important in subsurface identification. Some beds, not exposed here, are glauconitic.

The massive dolomite in the central part of the west quarry face is a reef core surrounded by reef-flank beds which dip away from the core. Most of the core probably was made of dome-shaped algal growths (Cryptozoon) which since have been largely destroyed by dolomitization. The bedding surfaces are marked by deeply incised labyrinthine ridges and furrows. The dolomite contains a sparse fauna which has been identified by G. O. Raasch. It consists chiefly of the gastropods Hypseloconus and Scaevogyra and the trilobites Plethometopus and Saukiella sp. cf. indenta Ulrich and Resser.

These beds have been traced in subsurface into the Potosi dolomite of Missouri, to which they are very similar in lithology, fauna, and stratigraphic position. They also are believed to be equivalent to the St. Lawrence dolomite of Wisconsin. They are overlain in subsurface by cherty sandy gray dolomite without drusy quartz, which is correlated with the Eminence formation of Missouri and with the Lodi-Jordan-Sunset Point (Madison) clastic sequence of Wisconsin.

The Trempealeau dolomite in the quarry one-half mile northward is greatly shattered by the combined effects of jointing, cave-collapse, weathering, and intensive blasting.

22.6 Turn left (east) on gravel road.

22.7 The low ridge on the horizon at the right (south) is composed of Trempealeau and Oneota dolomites on the crest of the Ashton arch. The ridge runs east-west through the town of Ashton, also visible on the horizon.

24.6 STOP SIGN - Junction with U. S. Highway Alt. 30. Turn right (south) on U. S. Alt. 30.

25.6 Trempealeau dolomite is visible in the quarry to the left (east), on the south side of a gravel road.

Mileage

26.6 Oneota dolomite is exposed in quarries to the left (east) on both sides of a gravel road. A fauna typical of the Gasconade formation of Missouri was recovered here.

26.7 Oneota dolomite is exposed in a low road bank on the left (east).

26.9 City limits of Ashton, population 913.

27.0 Quarry in Oneota dolomite to right (west), behind American Legion clubhouse.

27.1 CAUTION - Straight ahead on county black-top road, leaving U. S. Alt. 30 at westward curve in highway.

Cross Chicago and Northwestern Railway tracks (main line, Chicago to Omaha), and leave Ashton.

27.6 Turn left (east).

28.1 Turn right (south). A low rock ridge lies to the east.

29.1 Road jogs at township line.

30.0 STOP SIGN - at intersection with county road. Turn left (east) on black-top road.

30.2 STOP 11 - ILLINOIAN AND WISCONSIN DRIFT-SHEETS.

N. line NW.$\frac{1}{4}$ NW.$\frac{1}{4}$ Sec. 11, T. 21 N., R. 11 E., Lee County.

Discussion Leader: M. M. Leighton

The boundary between the Illinoian till sheet to the west and the Wisconsin Shelbyville till sheet to the east passes just east of the road intersection, although there is no topographic feature to indicate this fact.

The boundary of the area covered by Wisconsin ice is commonly marked by a prominent moraine south of the Green River Lobe (fig. 7), but in this region it usually can be mapped only by determining the depth of leaching in auger borings. The relatively great depth of leaching on the Illinoian drift (11$\frac{1}{2}$ feet here) contrasts strikingly with the much shallower depth of leaching on the early Wisconsin Shelbyville drift (4$\frac{1}{2}$ feet).

Samples of drift from auger borings in this vicinity have been laid beside the road near the highway intersection for inspection by the party. One set of samples was taken from a boring one mile westward, where the following sequence typical of the Illinoian drift was logged (M. M. Leighton, 1922):

Mileage

	Ft.	In.
Soil (Recent)	1	0
Loess, leached (Tazewell)	4	0
Sand, gravelly, leached (Shelbyville outwash)	1	0
Gumbotil (Sangamon weathering of Illinoian till)	2	6
Till, leached (Illinoian)	3	0
Till, calcareous "	0	6
	12	0

The second set of samples was taken from a boring 0.2 mile east of the intersection and shows a typical sequence on Wisconsin drift (M. M. Leighton, 1922).

	Ft.	In.
Soil	1	3
Loess, leached (Tazewell)	2	3
Till, leached (Shelbyville)	0	9
Till, calcareous "	1	9
	6	0

33.3 Bloomington moraine on skyline to right (south) with outwash plain in foreground. Both of these features are best seen from the summit of the rock ridge at Stop 12.

36.5 STOP SIGN: Intersection with U. S. Highway 51. Continue straight across highway.

36.9 Turn right (south) on gravel lane into quarry of Stone Ridge Limestone Company. Park in lot beside company buildings at head of ramp leading to quarry.

40.1 STOP 12 - (last stop) - ROCHELLE SOUTH - TREMPEALEAU (POTOSI), GUNTER AND ONEOTA FORMATIONS.

Quarry on N. line NE.$\frac{1}{4}$ SE.$\frac{1}{4}$ NE.$\frac{1}{4}$ Sec. 26, T. 39 N., R. 1 E., Lee County.

Discussion Leader: H. B. Willman

See figure 17.

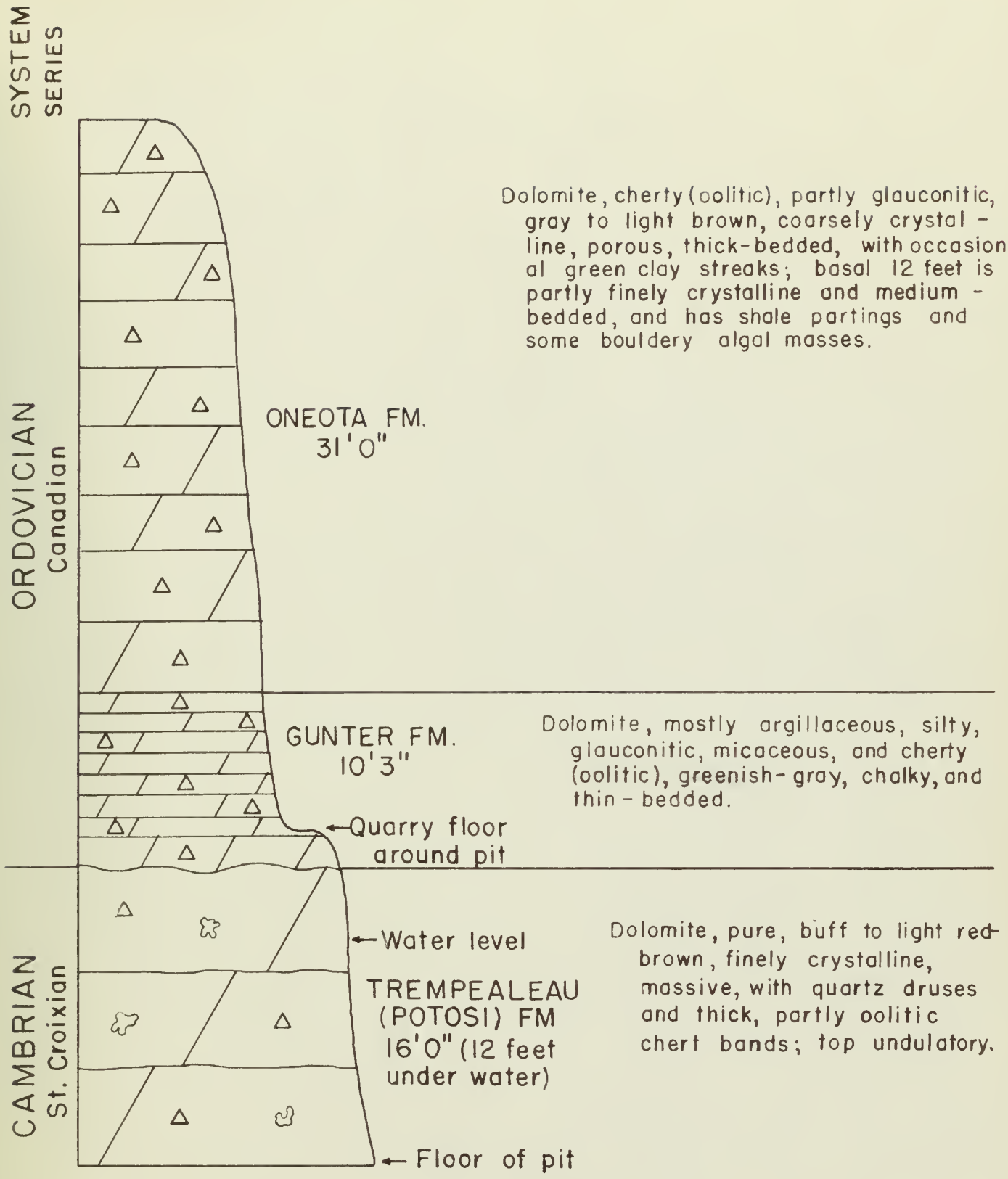


FIG. 17 – STOP 12

Mileage

The Oneota-Gunter contact appears conformable and transitional. The basal 12 feet of the Oneota partly resembles the Gunter, and an Oneota-like bed occurs in the middle of the Gunter. The contact is drawn at the horizon of maximum lithologic change. Recognition of the Gunter formation is based on similarities in lithology, stratigraphic position, and stratigraphic relations, and upon subsurface tracing of the unit through western Illinois to Missouri. Normally the Gunter of Illinois contains shale and sandstone beds, but they are absent here. Gunter equivalents also have been traced into southern Wisconsin. The Oneota strata probably are equivalent to the lower part of the Gasconade formation in Missouri (Van Buren faunal zone).

The Gunter rests unconformably on the Trempealeau formation. Upper Trempealeau (Eminence) strata wedge out northward against the flanks of the Ashton arch so that here, on top of the arch, the Gunter rests on lower Trempealeau (Potosi) beds.

You are now located 1/2 mile east of U. S. Highway 51, 6 miles south of Rochelle, 21 miles east of Dixon, 23 miles north of Mendota, and 23 miles west of DeKalb. We wish you a safe journey home!

END OF CONFERENCE